ORIGINAL NEW APPLICATION

JOHNSON UTILITIES L.L.C.

*5230 East Shea Boulevard * Scottsdale, Arizona 852..*
PH: (480) 998-3300; FAX: (480) 483-7908

October 13, 2006

Docket Control
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

WS-02987A-06-0667

Attached is an application by Johnson Utilities Company, L.L.C. for an Extension of its Certificate of Convenience and Necessity (CC&N). The purpose of this application is to expand our existing water and sewer service area to include the developments known as Monterra, Montessa, Florence Plaza, and the portions of Walker Butte that are currently outside the CC&N. The CC&N application has been made at the request of the land owners and developers. The Town of Florence has already prepared letters supporting Johnson Utilities application to serve Walker Butte and Florence Plaza which has been referred to as the Barclay Group. The letters have been attached to the application as Attachment 10. The town is in the process of preparing similar letters for Monterra and Montessa. The letters of support by the Town will be docketed with this application when available. The request for service letters from the land owners are attached to the application as Attachment 11. Also attached for review are the preliminary engineering water and sewer reports for Monterra, Montessa, and Walker Butte Phase 1. They are attached as Attachments 12, 13, and 14 respectively. Thank you for your time and consideration in this matter.

Sincerely,

Daniel Hodges
Johnson Utilities, L.L.C.

Arizona Corporation Commission
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ARIZONA CORPORATION COMMISSION

APPLICATION FOR AN EXTENSION OF CERTIFICATE OF CONVENIENCE AND NECESSITY

WATER AND/OR SEWER

A. The name, address and telephone number of the Applicant is:

Johnson Utilities, L.L.C.
5230 E. Shea Blvd., Suite 200
Scottsdale, AZ. 85254
480-998-3300

B. The name, address, and telephone number of management contact is:

Brian P. Tompsett
Johnson Utilities, L.L.C.
5230 E. Shea Blvd., Suite 200
Scottsdale, AZ. 85254
480-998-3300

C. List the name, address and telephone number of the operator certified by the Arizona Department of Environmental Quality.

Gregory Brown
Specific Engineering, L.L.C.
5230 E Shea Blvd. Suite 220
Scottsdale, AZ 85254
480-987-9870

D. List the name, address and telephone number of the attorney for the Applicant:

Richard L. Sallquist
Sallquist, Drummond & O'Connor, P.C.
4500 South LakeShore Dr., Suite 339
Tempe, AZ. 85282
480-839-5202

E. Attach the following documents that apply to you:

1. Certificate of Good Standing (if corporation)

See Attachment 1

2. Corporate Resolution Authorizing this application (if required by the corporation's Articles of Incorporation)

Not Applicable

F. Attach a legal description of the area requested by either **CADASTRAL** (quarter section description) or **Metes and Bounds** survey. References to parcels and dockets will not be accepted.

See Attachment 2

G. Attach a detailed map using the form provided as attachment B. Shade and outline the area requested. Also indicate the present certificated area by using different colors.

See Attachment 3

H. Attach a current balance sheet and profit and loss statement

See Attachment 4

I. Provide the following information:

1. Indicated the estimated number of customers, by class, to be served in the new area in each of the next five years:

See Attachment 5

2. (WATER ONLY) Indicate the projected annual water consumption, in gallons, for each of the customer classes in the new area for each of the next five years.

See Attachment 5

3. Indicate the total estimated annual operating revenue from the new area for each of the next five years.

See Attachment 6

- **Complete Attachment "D" (Water Use Data Sheet) for the past 13 months.**

See Attachment 7

4. Indicate the total estimated annual operating expenses attributable to the new area for each of the next five years.

See Attachment 6

J. Total estimated cost to construct utility facilities to serve customers in the requested area:

The estimated cost to serve the customers in the requested area is $8,698,417.00 for water and $9,666,692 for sewer.

K. Explain method of financing utility facilities (see paragraph 8 of instructions)

The construction of the additional utility facilities needed to serve the area covered by this Application will be financed primarily by advances in aid of construction and hook-up fees in accordance with Commission regulations and Johnson Utilities applicable tariffs. Additional facilities will also be added pursuant to the terms of any main extension agreements between Johnson Utilities, and property owners. A copy of all fully executed main extension agreements for water facilities between parties shall be filed with the Commission in support of this Application when completed.

L. Estimated starting and completion date of construction of utility facilities:

Start date: As soon as the CC&N is approved Completion date: December, 2013

M. Attach the following permits:

1. Franchise from either the City or County for the area requested.

The operating agreement between the Town of Florence and Johnson Utilities allowing for the use of present and future right-of-ways is attached hereto as Attachment 8.

2. Arizona Department of Environmental Quality or designee's approval to construct facilities

Arizona Department of Environmental Quality's Approval to Construct the facilities to serve the requested extension area will be provided to the Commission as soon as they are received by Johnson Utilities.

3. Arizona State Land Department approval. (If you are including any State land in your requested area this approval is needed.)

Not Applicable

4. U.S. Forest Service approval-

Not Applicable

5. (WATER ONLY) If the area requested is within an Active Management Area, attach a copy of the utility's Designation of an Assured Water Supply, or the developer's Certificate of 100 year Assured Water Supply issued by the Arizona Department of Water Resources.

Attachment 9

• If the area requested is outside an Active Management Area, attach the developer's Adequacy Statement issued by the Arizona Department of Water Resources if applied for by the developer.

Not Applicable

• If the area requested is outside an Active Management Area and the developer does not obtain an Adequacy Statement, provide sufficient detailed information to prove that adequate water exists to provide water to the area requested.

Not Applicable

(Signature of Authorized Representative)

Brian P. Tompsett
(Print of Type Name Here)

Executive Vice President
(Title)

SUBSCRIBED AND SWORN to before me this 16 day of October, 2005

NOTARY PUBLIC

My Commission Expires 12-23-2006

CINDY L. GIBSON
Notary Public - Arizona
MARICOPA COUNTY
My Comm. Exp. 12-23-2006

ATTACHMENT 1

STATE OF ARIZONA

Office of the

CORPORATION COMMISSION

CERTIFICATE OF GOOD STANDING

To all to whom these presents shall come, greeting:

I, Brian C. McNeil, Executive Secretary of the Arizona Corporation Commission, do hereby certify that

******JOHNSON UTILITIES, L.L.C.******

a domestic limited liability company organized under the laws of the State of Arizona, did organize on the 5th day of June 1997.

I further certify that according to the records of the Arizona Corporation Commission, as of the date set forth hereunder, the said limited liability company is not administratively dissolved for failure to comply with the provisions of A.R.S. section 29-601 et seq., the Arizona Limited Liability Company Act; and that the said limited liability company has not filed Articles of Termination as of the date of this certificate.

This certificate relates only to the legal existence of the above named entity as of the date issued. This certificate is not to be construed as an endorsement, recommendation, or notice of approval of the entity's condition or business activities and practices.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the Arizona Corporation Commission. Done at Phoenix, the Capital, this 1st Day of December, 2004, A. D.

SEAL OF THE ARIZONA CORPORATION COMMISSION
DITAT DEUS
1912

Executive Secretary

By

ATTACHMENT 2

EXHIBIT A

LEGAL DESCRIPTION

WALKER BUTTE

THE NORTHWEST QUARTER OF SECTION 14, TOWNSHIP 4 SOUTH, RANGE 8 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUTNY, ARIZONA;

THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER; AND THE SOUTHWEST QUARTER OF SECTION 14, TOWNSHIP 4 SOUTH, RANGE 8 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA;

EXCEPT THEREFROM ANY PORTION LYING WITHIN THE SOUTHERN PACIFIC RAILROAD RIGHT OF WAY.

GOVERNMENT LOT 2, SECTION 3, TOWNSHIP 5 SOUTH, RANGE 8 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA.

Legal Description

Florence Plaza

A PORTION OF THE NORTH HALF OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 36, AND A PORTION OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 25, TOWNSHIP 4 SOUTH, RANGE 8 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A 3" BRASS CAP MARKING THE NORTHEAST CORNER OF SECTION 36, FROM WHICH A BRASS CAP MARKING THE NORTH QUARTER CORNER OF SECTION 36 BEARS SOUTH 88 DEGREES 59 MINUTES 19 SECONDS WEST, A DISTANCE OF 2617.56 FEET; AND FROM WHICH A 3" ALUMINUM CAP MARKING THE EAST QUARTER CORNER OF SECTION 36 BEARS SOUTH 00 DEGREES 20 MINUTES 15 SECONDS EAST, A DISTANCE OF 2643.59 FEET, SAID NORTHEAST CORNER MARKING THE POINT OF BEGINNING;

THENCE SOUTH 00 DEGREES 20 MINUTES 15 SECONDS EAST ALONG THE EAST BOUNDARY OF THE NORTHEAST QUARTER OF SECTION 36, A DISTANCE OF 660.90 FEET TO A SET NAIL (MONUMENTED 33' WEST BY A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512);

THENCE SOUTH 89 DEGREES 04 MINUTES 15 SECONDS WEST ALONG THE SOUTH BOUNDARY OF THE NORTH HALF OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 36, A DISTANCE OF 960.08 FEET TO A 5/8" REBAR WITH ALUMINUM CAP RLS #37512;

THENCE NORTH 00 DEGREES 13 MINUTES 20 SECONDS WEST, A DISTANCE OF 659.54 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #27512;

THENCE NORTH 00 DEGREES 17 MINUTES 29 SECONDS WEST, A DISTANCE OF 57.86 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512 TO A POINT OF NON-TANGENT CURVATURE WHOSE RADIUS BEARS NORTH 00 DEGREES 52 MINUTES 53 SECONDS WEST, 24545.95 FEET;

THENCE EASTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 00 DEGREES 04 MINUTES 01 SECONDS, A DISTANCE OF 28.68 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512;

THENCE NORTH 89 DEGREES 03 MINUTES 07 SECONDS EAST, A DISTANCE OF 790.56 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512, TO

A POINT OF CURVATURE WHOSE RADIUS BEARS NORTH 00 DEGREES 56 MINUTES 53 SECONDS WEST, 707.56 FEET MARKED BY A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512;

THENCE EASTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 06 DEGREES 06 MINUTES 26 SECONDS, A DISTANCE OF 75.37 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512;

THENCE NORTH 81 DEGREES 34 MINUTES 51 SECONDS EAST, A DISTANCE OF 31.66 FEET TO A SET NAIL;

THENCE SOUTH 00 DEGREES 20 MINUTES 04 SECONDS EAST, A DISTANCE OF 64.95 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512;

THENCE NORTH 88 DEGREES 59 MINUTES 19 SECONDS EAST ALONG THE NORTH BOUNDARY OF THE NORTHEAST QUARTER OF SECTION 36, A DISTANCE OF 33.00 FEET TO 3" BRASS CAP MARKING THE POINT OF BEGINNING;

EXCEPT THE 150' SOUTHERN PACIFIC RAILROAD RIGHT-OF-WAY MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A 3" BRASS CAP MARKING THE NORTHEAST CORNER OF SECTION 36, FROM WHICH A BRASS CAP MARKING THE NORTH QUARTER CORNER OF SECTION 36 BEARS SOUTH 88 DEGREES 59 MINUTES 19 SECONDS WEST, A DISTANCE OF 2617.56 FEET; AND FROM WHICH A 3" ALUMINUM CAP MARKING THE EAST QUARTER CORNER OF SECTION 36 BEARS SOUTH 00 DEGREES 20 MINUTES 15 SECONDS EAST, A DISTANCE OF 2643.59 FEET;

THENCE SOUTH 88 DEGREES 59 MINUTES 19 SECONDS WEST ALONG THE NORTH BOUNDARY OF THE NORTHEAST QUARTER OF SECTION 36, A DISTANCE OF 33.00 FEET TO 3" BRASS CAP;

THENCE NORTH 00 DEGREES 20 MINUTES 04 SECONDS WEST, A DISTANCE OF 64.95 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512;

THENCE SOUTH 81 DEGREES 34 MINUTES 51 SECONDS WEST, A DISTANCE OF 31.66 FEET TO A POINT OF CURVATURE WHOSE RADIUS BEARS NORTH 07 DEGREES 03 MINUTES 19 SECONDS WEST, 707.06 FEET MARKED BY A SET NAIL;

THENCE SOUTHWESTERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 4 DEGREES 58 MINUTES 40 SECONDS, A DISTANCE OF 61.43 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512 MARKING THE POINT OF BEGINNING;

THENCE SOUTH 64 DEGREES 59 MINUTES 19 SECONDS WEST ALONG THE SOUTH BOUNDARY OF THE SOUTHERN PACIFIC RAILROAD RIGHT-OF-WAY, A DISTANCE OF 917.53 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512;

THENCE NORTH 00 DEGREES 13 MINUTES 20 SECONDS WEST, A DISTANCE OF 165.22 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512;

THENCE NORTH 64 DEGREES 59 MINUTES 19 SECONDS EAST ALONG THE NORTH BOUNDARY OF THE SOUTHERN PACIFIC RAILROAD RIGHT-OF-WAY, A DISTANCE OF 512.01 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512;

THENCE NORTH 89 DEGREES 03 MINUTES 07 SECONDS EAST, A DISTANCE OF 354.25 FEET TO A SET 5/8" REBAR WITH ALUMINUM CAP RLS #37512, TO A POINT OF TANGENT CURVATURE WHOSE RADIUS BEARS NORTH 00 DEGREES 56 MINUTES 53 SECONDS WEST, 707.06 FEET;

THENCE EASTERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 01 DEGREES 07 MINUTES 45 SECONDS, A DISTANCE OF 13.94 FEET TO A SET 5/8 REBAR WITH ALUMINUM CAP RLS #37512 MARKING THE POINT OF BEGINNING.

LEGAL DESCRIPTION

MONTESSA

THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER SECTION 36, TOWNSHIP 4 SOUTH, RANGE 8 EAST OF THE GILA AND SALT RIVER BASE AND MERIDAN, PINAL COUNTY, ARIZONA:

EXCEPT THAT PORTION DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SAID SECTION 36,

THENCE NORTH 269.25 FEET THENCE WEST 809 FEET

THENCE SOUTH 269.25 FEET

THENCE EAST 809 FEET TO THE POINT OF BEGINNING, AND

EXCEPT THAT PORTION AS CONVEYED IN WARRANTY DEED RECORDED IN INSTRUMENT NO. 03-70323 AND RE-RECORDED IN INSTRUMENT NO. 04-11194, DESCRIBED AS FOLLOWS:

THE SOUTH 269.25 FEET OF THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 36, TOWNSHIP 4 SOUTH, RANGE 8 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA; AND

EXCEPT THE EAST 809.00 FEET THEREOF; AND

EXCEPT ANY AND ALL MINERALS, ORES AND METALS OF EVERY KIND AND CHARACTER, AND ALL COAL, ASPHALTUM, OIL, CASES, FERTILIZERS, FOSSILS AND OTHER LIKE SUBSTANCES IN OR UNDER SAID LAND AS RESERVED TO THE STATE OF ARIZONA IN PATIENT TO SAID LAND.

Monterrra North, East and South Overall Exterior Legal Description:

Portions of the South half of the Southwest quarter of Section 29, Section 31 and the West half of Section 32, Township 4 South, Range 9 East, and of the Northeast quarter of Section 6, Township 5 South, Range 9 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona, described as follows:

Beginning at the West quarter corner of said Section 31, which is monumented by a brass cap, from which the following corners bear for a basis of bearings:

1. The Southwest corner of said Section 31, which is monumented by a brass cap in a hand hole, bears South 00 degrees 26 minutes 24 seconds East, 2,644.09 feet,
2. The East quarter corner of said Section 31, which is monumented by a 5/8-inch rebar, bears North 89 degrees 58 minutes 50 seconds East, 5,232.23 feet;
3. The Northwest corner of said Section 31, which is monumented by a brass cap, bears North 00 degrees 25 minutes 51 seconds West, 2,643.50 feet;

Thence from said West quarter corner of said Section 31, North 00 degrees 25 minutes 51 seconds West, along the West line of the Northwest quarter of said Section 31, 1,706.61 feet;

Thence North 89 degrees 34 minutes 09 seconds East, 96.00 feet;

Thence North 79 degrees 40 minutes 38 seconds East, 330.95 feet to a point of curvature of a curve concave to the Northwest, having a radial bearing of North 10 degrees 19 minutes 22 seconds West, a radius of 700.00 feet, a chord bearing of North 67 degrees 43 minutes 03 seconds East, a chord distance of 290.11 feet and a central angle of 23 degrees 55 minutes 10 seconds;

Thence Northeasterly, along the arc of said curve, 292.23 feet to a point of tangency;

Thence North 55 degrees 45 minutes 28 seconds East, a distance of 567.96 feet to a point of curvature of a curve concave to the Northwest, having a radial bearing of North 34 degrees 14 minutes 32 seconds West, a radius of 200.00 feet, a chord bearing of North 38

degrees 25 minutes 53 seconds East, a chord distance of 119.13 feet and a central angle of 34 degrees 39 minutes 10 seconds;

Thence Northeasterly, along the arc of said curve, 120.96 feet to a point on a non-tangent line;

Thence South 89 degrees 57 minutes 26 seconds East, 1,382.41 feet to a point on the West line of the Northeast quarter of said Section 31, from which the North quarter corner of said Section 31, which is monumented by an aluminum cap, bears North 00 degrees 24 minutes 32 seconds West, 353.01 feet;

Thence South 00 degrees 24 minutes 32 seconds East, along said West line of the Northeast quarter of Section 31, 967.32 feet to the Northwest corner of the South half of the Northeast quarter of Section 31, from which the South quarter corner of Section 31, which is monumented by a rebar with cap, bears South 00 degrees 24 minutes 32 seconds East, 3,960.62 feet;

Thence South 89 degrees 59 minutes 33 seconds East, along the North line of said South half of the Northeast quarter of Section 31, 2,611.92 feet to the Northeast corner of said South half of the Northeast quarter of Section 31, from which the Northwest corner of said Section 32, which is monumented by an aluminum cap, bears North 00 degrees 26 minutes 41 seconds West, 1,319.10 feet, and from which said East quarter corner of Section 31 bears South 00 degrees 26 minutes 41 seconds East, 1,319.10 feet;

Thence North 89 degrees 53 minutes 15 seconds East, along the South line of the Northwest quarter of the Northwest quarter of said Section 32, 1,310.29 feet to the Southeast corner of said Northwest quarter of the Northwest quarter of Section 32;

Thence North 00 degrees 26 minutes 01 second West, along the East line of the Northwest quarter of the Northwest quarter of said Section 32, 1,319.57 feet to the Northeast corner of said Northwest quarter of the Northwest quarter of Section 32, from which the North quarter corner of said Section 32, which is monumented by a ½-inch rebar, bears North 89 degrees 52 minutes 01 second East, 1,310.54 feet;

Thence South 89 degrees 52 minutes 01 second West, along the North line of said Northwest quarter of the Northwest quarter of Section 32, 1,310.54 feet to said Northwest corner of Section 32;

Thence North 00 degrees 00 minutes 02 seconds East, along the West line of the South half of the Southwest quarter of Section 29, 1,321.09 feet to the Northwest corner of said South half of the Southwest quarter of Section 29, from which the West quarter corner of Section 29, which is monumented by a G.L.O. brass cap, bears North 00 degrees 00 minutes 02 seconds East, 1,321.09 feet;

Thence North 89 degrees 52 minutes 53 seconds East, along the North line of said South half of the Southwest quarter of Section 29, 2,618.40 feet to the Northeast corner of said South half of the Southwest quarter of Section 29, from which the North quarter corner of Section 29, which is monumented by a G.L.O. brass cap, bears North 00 degrees 06 minutes 57 seconds West, 3,962.09 feet;

Thence South 00 degrees 06 minutes 57 seconds East, along the East line of said South half of the Southwest quarter of Section 29, 1,320.44 feet to said North quarter corner of Section 32;

Thence South 00 degrees 25 minutes 22 seconds East, along the East line of the West half of said Section 32, 3,960.66 feet to the Northeast corner of the South half of the Southwest quarter of said Section 32, from which the South quarter corner of said Section 32, which is monumented by a 1-inch iron pipe, bears South 00 degrees 25 minutes 22 seconds East, 1,320.60 feet;

Thence South 89 degrees 55 minutes 13 seconds West, along the North line of said South half of the Southwest quarter of Section 32, 592.51 feet

Thence South 32 degrees 17 minutes 51 seconds West, 502.29 feet;

Thence South 37 degrees 05 minutes 50 seconds West, 490.61 feet;

Thence South 70 degrees 21 minutes 02 seconds West, 406.16 feet;

Thence South 85 degrees 17 minutes 03 seconds West, 228.72 feet;

Thence North 82 degrees 11 minutes 11 seconds West, 188.02 feet;

Thence South 84 degrees 58 minutes 14 seconds West, 428.10 feet;

Thence South 73 degrees 14 minutes 04 seconds West, 240.96 feet to a point on the East line of the Southeast quarter of said Section 31, from which the Southeast corner of said Section 31, which is

monumented by an aluminum cap, bears South 00 degrees 27 minutes 44 seconds East, 270.08 feet, and from which said East quarter corner of Section 31 bears North 00 degrees 27 minutes 44 seconds West, 2,370.00 feet;

Thence continuing South 73 degrees 14 minutes 04 seconds West, 17.33 feet;

Thence South 66 degrees 43 minutes 53 seconds West, 296.87 feet;

Thence South 52 degrees 55 minutes 37 seconds West, 245.51 feet to a point on the South line of the Southeast quarter of said Section 31, from which the Southeast corner of said Section 31 bears North 89 degrees 58 minutes 32 seconds East, 487.38 feet;

Thence South 89 degrees 58 minutes 32 seconds West, along the South line of the Southeast quarter of said Section 31, 200.69 feet to a point, from which said South Quarter Corner of Section 31 bears South 89 degrees 58 minutes 32 seconds West, 1,927.13 feet, said point also being a point on a non-tangent curve, concave to the East, having a radial bearing of South 65 degrees 06 minutes 43 seconds East, a radius of 770.54 feet, a chord bearing of South 16 degrees 31 minutes 16 seconds West, a chord distance of 224.24 feet and a central angle of 16 degrees 44 minutes 02 seconds;

Thence Southerly, along the arc of said curve, 225.04 feet to a point of tangency;

Thence South 08 degrees 09 minutes 15 seconds West, 176.65 feet to a point of curvature on a curve, concave to the Northwest, having a radial bearing of North 81 degrees 50 minutes 45 seconds West, a radius of 295.98 feet, a chord bearing of South 42 degrees 12 minutes 07 seconds West, a chord distance of 331.43 feet and a central angle of 68 degrees 05 minutes 43 seconds;

Thence Southwesterly, along the arc of said curve, 351.77 feet to a point of tangency;

Thence South 76 degrees 14 minutes 58 seconds West, 297.84 feet;

Thence South 77 degrees 33 minutes 14 seconds West, 265.27 feet;

Thence South 74 degrees 50 minutes 07 seconds West, 147.12 feet;

Thence South 86 degrees 00 minutes 59 seconds West, 93.74 feet to a point on a non-tangent curve, concave to the South, having a radial bearing of South 03 degrees 59 minutes 05 seconds East, a radius of 332.92 feet, a chord bearing of South 71 degrees 51 minutes 18 seconds West, a chord distance of 162.89 feet and a central angle of 28 degrees 19 minutes 13 seconds;

Thence Westerly, along the arc of said curve, 164.56 feet to a point of tangency;

Thence South 57 degrees 41 minutes 42 seconds West, 21.13 feet to a point on a non-tangent curve, concave to the North, having a radial bearing of North 27 degrees 48 minutes 59 seconds West, a radius of 488.56 feet, a chord bearing of South 69 degrees 04 minutes 12 seconds West, a chord distance of 117.16 feet and a central angle of 13 degrees 46 minutes 24 seconds;

Thence Westerly, along the arc of said curve, 117.44 feet to a point on a non-tangent line;

Thence South 75 degrees 57 minutes 28 seconds West, 240.06 feet to a point on a non-tangent curve, concave to the North, having a radial bearing of North 14 degrees 00 minutes 33 seconds West, a radius of 205.59 feet, a chord bearing of North 83 degrees 45 minutes 17 seconds West, a chord distance of 142.35 feet and a central angle of 40 degrees 30 minutes 31 seconds;

Thence Westerly, along the arc of said curve, 145.35 feet to a point of tangency;

Thence North 63 degrees 30 minutes 01 second West, 122.12 feet;

Thence North 65 degrees 16 minutes 13 seconds West, 52.68 feet to a point on the West line of said Northeast quarter of Section 6;

Thence North 01 degree 11 minutes 22 seconds West, along the West line of the Northeast quarter of said Section 6, 877.81 feet to said South quarter corner of Section 31;

Thence South 89 degrees 53 minutes 51 seconds West, along the South line of the Southwest quarter of said Section 31, 2,618.04 feet to said Southwest corner of Section 31;

Thence North 00 degrees 26 minutes 24 seconds West, along the West line of the Southwest quarter of said Section 31, 2,644.09 feet to said West quarter corner of Section 31 band the point of beginning.

Monterra South
Overall Legal Description:

That portion of the South Half and the Northwest Quarter of Section 31 and the Southwest Quarter of Section 32 of Township 4 South, Range 9 East of the Gila and Salt River Meridian, Pinal County, Arizona, more particularly described as follows:

BEGINNING at the West Quarter Corner of said Section 31, which is monumented by a brass cap, from which the following corners bear for a Basis of Bearings:

1. The Southwest Corner of said Section 31, which is monumented by a brass cap in handhole, bears S00°26'24"E, a distance of 2644.09 feet,
2. The Northwest Corner of said Section 31, which is monumented by a brass cap, bears N00°25'51"W, a distance of 2643.50 feet,
3. The East Quarter Corner of said Section 31, which is monumented by a 5/8" rebar, bears N89°58'50"E, a distance of 5232.23 feet;

THENCE from said West Quarter Corner of said Section 31, N00°25'51"W along the West Line of said Northwest Quarter of Section 31, a distance of 89.51 feet;

THENCE N89°33'36"E, a distance of 1054.99 feet;

THENCE S00°26'24"E, a distance of 150.00 feet;

THENCE N89°33'36"E, a distance of 900.96 feet;

THENCE S00°24'32"E, a distance of 228.55 feet;

THENCE N89°35'28"E, a distance of 333.36 feet;

THENCE S48°51'21"E, a distance of 273.48 feet;

THENCE N44°47'20"E, a distance of 66.70 feet;

THENCE N47°26'12"E, a distance of 369.82 feet;

THENCE S47°40'39"E, a distance of 349.21 feet;

THENCE S48°37'27"E, a distance of 15.43 feet;

THENCE S53°33'40"E, a distance of 65.00 feet;

THENCE S61°32'32"E, a distance of 65.00 feet;

THENCE S69°31'24"E, a distance of 65.00 feet;

THENCE S77°30'15"E, a distance of 65.00 feet;

THENCE S85°29'07"E, a distance of 65.00 feet;

THENCE S89°44'03"E, a distance of 4.21 feet;

THENCE S89°59'33"E, a distance of 1378.52 feet to a point on a non-tangent curve concave to the East, having a radial bearing of S63°51'14"E, a radius of 2042.50 feet, a chord bearing of S14°38'07"W, a chord distance of 815.19 feet and a central angle of 23°01'19";

THENCE southerly along the arc of said curve, a distance of 820.70 feet to a point on a non-tangent line;

THENCE S86°37'20"E, a distance of 85.00 feet to a point on a non-tangent curve concave to the Northeast, having a radial bearing of S86°53'13"E, a radius of 113.59 feet, a chord bearing of S43°27'20"E, a chord distance of 164.98 feet and a central angle of 93°08'15";

THENCE southeasterly along the arc of said curve, a distance of 184.65 feet to a Point of Tangency;

THENCE N89°58'32"E, a distance of 483.61 feet to a point on the East Line of the Southeast Quarter of said Section 31, from which said East Quarter Corner of Section 31 bears N00°27'44"W, a distance of 1426.24 feet, and from which the Southeast Corner of said Section 31, which is monumented by aluminum cap, bears S00°27'44"E, a distance of 1213.84 feet;

THENCE continuing N89°58'32"E into said Southwest Quarter of Section 32, a distance of 352.71 feet to a Point of Curvature of a curve concave to the North, having a radial bearing of N00°01'28"W, a radius of 925.00 feet, a chord bearing of N88°07'18"E, a chord distance of 59.85 feet and a central angle of 03°42'28";

THENCE easterly along the arc of said curve, a distance of 59.86 feet to a point on a non-tangent line;

THENCE S00°01'28"E, a distance of 476.94 feet;

THENCE N89°58'32"E, a distance of 50.00 feet;

THENCE S00°01'28"E, a distance of 150.00 feet;

THENCE S89°58'32"W a distance of 30.00 feet;
THENCE S00°01'28"E, a distance of 232.29 feet;

THENCE S84°58'14"W, a distance of 195.32 feet;

THENCE S73°14'04"W, a distance of 240.96 feet to a point on said East Line of the Southeast Quarter of Section 31, from which said East Quarter Corner of Section 31 bears N00°27'44"W, a distance of 2370.00 feet, and from which said Southeast Corner of Section 31 bears S00°27'44"E, a distance of 270.08 feet;

THENCE continuing S73°14'04"W into said Southeast Quarter of Section 31, a distance of 17.33 feet;

THENCE S66°43'53"W, a distance of 296.87 feet;

THENCE S52°55'37"W, a distance of 245.51 feet to a point on the South Line of said Southeast Quarter of Section 31, from which said Southeast Corner of Section 31 bears N89°58'32"E, a distance of 487.38 feet;

THENCE S89°58'32"W along said South Line of the Southeast Quarter of Section 31, a distance of 2127.81 feet to the South Quarter Corner of said Section 31, which is monumented by a rebar with cap;

THENCE S89°53'51"W along the South Line of the Southwest Quarter of said Section 31, a distance of 152.57 feet to a point, hereafter referred to as "Point A';

THENCE continuing S89°53'51"W along said South Line of the Southwest Quarter of said Section 31, a distance of 2465.46 feet to said Southwest Corner of Section 31;

THENCE N00°26'24"W along the West Line of said Southwest Quarter of Section 31, a distance of 2644.09 feet to said West Quarter Corner of Section 31 and the POINT OF BEGINNING;

EXCEPT the following portion, hereafter referred to as "Parcel 1-10";

"Parcel 1-10 (Future School Site)"

BEGINNING at said "Point A";

THENCE N00°06'09"W, a distance of 964.96 feet;

THENCE N11°40'21"E, a distance of 36.47 feet;

THENCE N28°40'09"E, a distance of 36.67 feet;

THENCE N36°16'00"E, a distance of 39.67 feet;

THENCE N30°02'21"E, a distance of 75.16 feet;

THENCE continuing N30°02'21"E, a distance of 85.00 feet to a point on a non-tangent curve concave to the Northeast and having a radial bearing of N30°02'21"E, a radius of 1075.50 feet, a central angle of 18°36'15", a chord bearing of N50°39'32"W and a chord distance of 347.69 feet, said point also being the TRUE POINT OF BEGINNING of "Parcel 1-10";

THENCE northwesterly along the arc of said curve, a distance of 349.22 feet to a point on a tangent line;

THENCE N41°21'24"W, a distance of 127.86 feet to a point on a tangent curve concave to the Northeast and having a radius of 1206.50 feet and a central angle of 03°21'16";

THENCE northwesterly along the arc of said curve, a distance of 70.63 feet to a point on a non-tangent line;

THENCE N44°47'20"E, a distance of 481.54 feet;

THENCE S54°38'15"E, a distance of 114.76 feet;

THENCE S51°01'42"E, a distance of 65.00 feet;

THENCE S50°38'58"E, a distance of 67.27 feet;

THENCE S54°15'39"E, a distance of 72.06 feet;

THENCE S58°11'54"E, a distance of 72.06 feet;

THENCE S62°08'10"E, a distance of 72.06 feet;

THENCE S66°04'25"E, a distance of 72.06 feet;

THENCE S70°00'40"E, a distance of 72.06 feet;

THENCE S73°56'55"E, a distance of 72.06 feet;

THENCE S77°53'11"E, a distance of 72.06 feet;

THENCE S81°49'26"E, a distance of 72.06 feet;

THENCE S85°45'41"E, a distance of 72.06 feet;

THENCE S89°41'16"E, a distance of 69.05 feet;

THENCE N89°47'14"E, a distance of 65.00 feet;

THENCE S89°59'33"E, a distance of 9.02 feet;

THENCE S00°00'27"W, a distance of 442.37 feet;

THENCE S78°58'44"W, a distance of 138.37 feet to a point on a tangent curve concave to the North and having a radius of 1075.50 feet and a central angle of 41°03'37";

THENCE westerly along the arc of said curve, a distance of 770.74 feet to the TRUE POINT OF BEGINNING of "Parcel 1-10".

Above described portion contains approximately the following area, more or less:

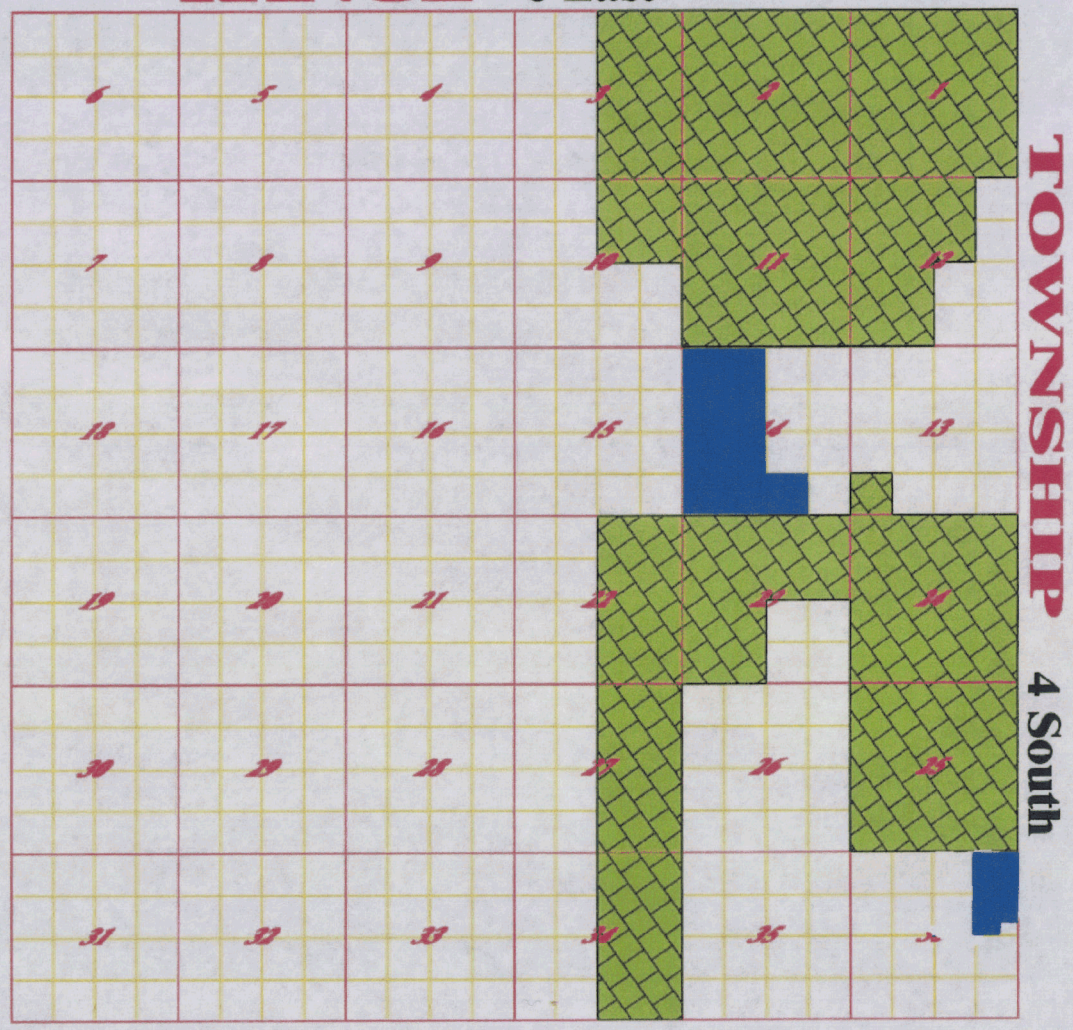
Gross Area of Monterra South	
12,200,594.21 sq. feet	280.09 acres
Area of Exception Parcel 1-10	
641,099.66 sq. feet	14.72 acres
Remainder Area of Monterra South	
11,559,494.55 sq. feet	265.37 acres

ATTACHMENT 3

Map No. 51

COUNTY: *Pinal*

RANGE 8 East



TOWNSHIP 4 South

WS-2987 (6)
Johnson Utilities Company

Sewer

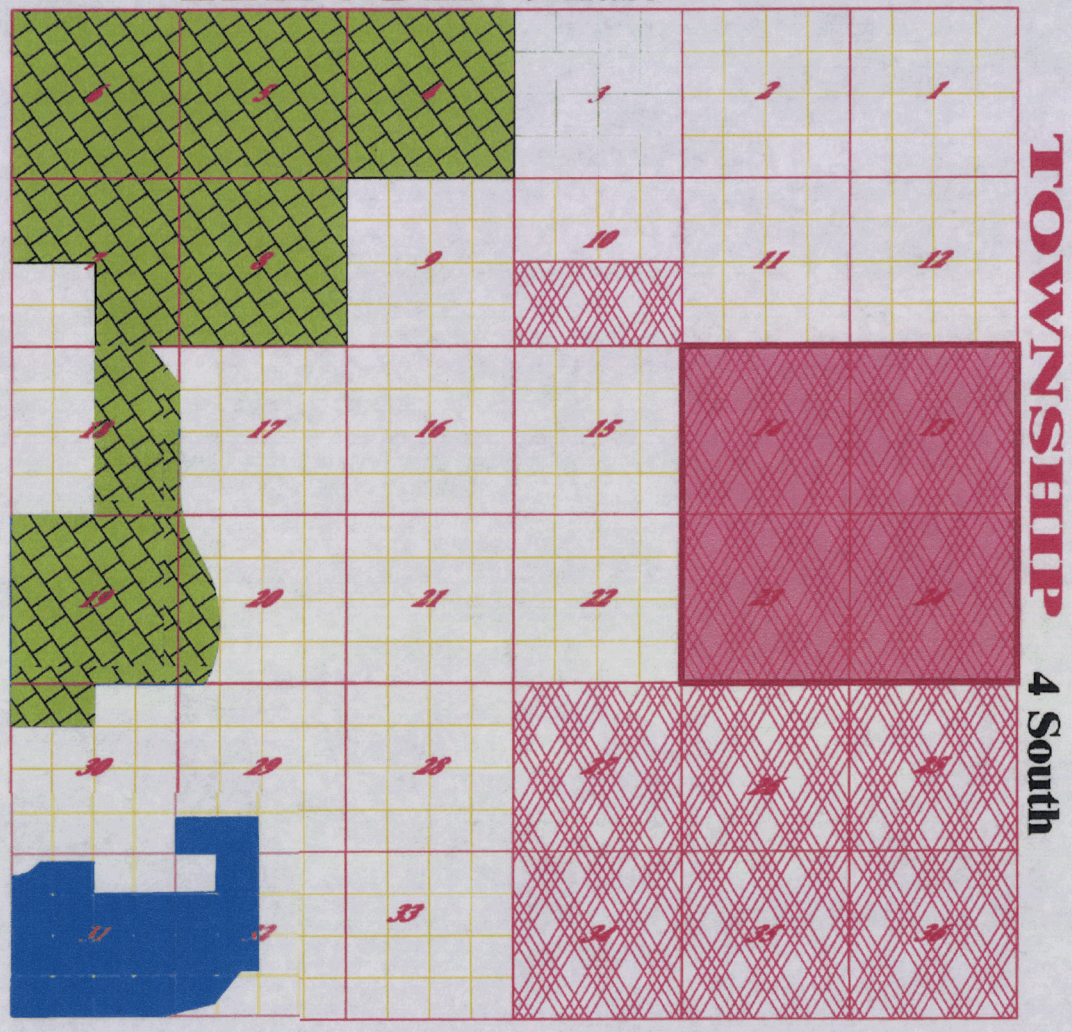
CC&N Requested

TR4S8E 22 APR 2003

Map No. 12

COUNTY: *Pinal*

RANGE 9 East



C-0005 (4) Sewer
City of Florence (Nonjurisdictional)

WS-2987 (6) Sewer
Johnson Utilities Company

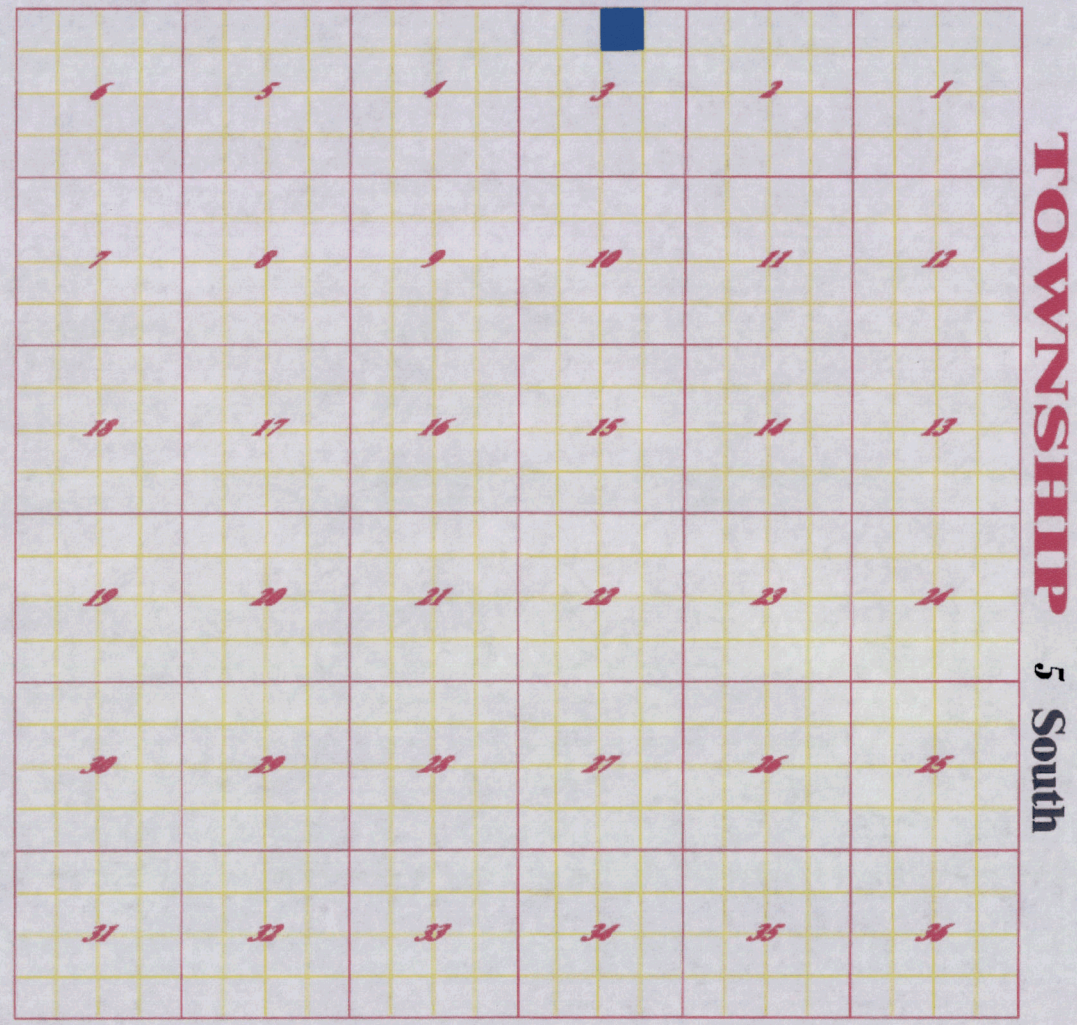
CC&N Requested

TR4S9E 22 APR 2003

Map No.

COUNTY: *Pinal*

RANGE 8 East



TOWNSHIP 5 South

WS-2987 (6)
Johnson Utilities Company

Sewer

CC&N Requested

Map No.

COUNTY: *Pinal*

RANGE 9 East

TOWNSHIP 5 South

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

WS-2987 (6)
Johnson Utilities Company

Sewer

CC&N Requested

ATTACHMENT 4

ULLMANN
& COMPANY P.C.
Certified Public Accountants

To The Members of
Johnson Utilities, L.L.C.
Scottsdale, Arizona

We have compiled the accompanying balance sheet of Johnson Utilities, L.L.C. as of December 31, 2005 and the related statement of income for the year then ended, in accordance with the Statements on Standards for Accounting and Review Services issued by the American Institute of Certified Public Accountants.

A compilation is limited to presenting in the form of financial statements information that is the representation of management. We have not audited or reviewed the accompanying financial statements and, accordingly, do not express an opinion or any other form of assurance on them.

Management has elected to omit substantially all of the disclosures and the statement of cash flows required by generally accepted accounting principles. If the omitted disclosures and statement of cash flows were included in the financial statements, they might influence the user's conclusions about the Company's financial position, results of operations, and cash flows. Accordingly, these financial statements are not designed for those who are not informed about such matters.

The Company is treated as a partnership for federal income tax purposes. Consequently, federal income taxes are not payable by, or provided for, the Company. Members are taxed individually on their shares of the Company's earnings. The Company's net income or loss is allocated among the members in accordance with the operating agreement of the Company.

This report is intended solely for the information and use of the owners, management, and others within the company and is not intended to be and should not be used by anyone other than these specified parties.

Ullmann & Company

Ullmann & Company, P.C.
Certified Public Accountants

March 24, 2006

2400 East Arizona Biltmore Circle • Suite 1220 • Phoenix, Arizona 85016
Telephone: (602) 224-0166 • FAX: (602) 224-6062 • e-mail: CPA@ULLMANNCPA.com • www.ULLMANNCPA.com

Johnson Utilities, L.L.C.
Balance Sheet
December 31, 2005

ASSETS	
Utility Plant	
Plant in Service	$ 77,405,052
Less: Accumulated Depreciation	(4,491,559)
Net Utility Plant in Service	$ 72,913,493
Construction Work in Progress	9,616,560
Net Utility Plant	$ 82,530,053
Current Assets	
Cash	$ 18,382,586
Accounts Receivable	1,660,226
Other Receivables	38,000
Total Current Assets	$ 20,080,812
Other Assets	
Deferred Legal Fees	$ 672,263
Deferred Engineering Fees	242,235
Prepaid Liability Insurance	31,075
SRP Deposit	65,120
Total Other Assets	$ 1,010,693
Total Assets	$ 103,621,558
MEMBER'S CAPITAL & LIABILITIES	
Member's Capital	$ 7,260,129
Contributions in Aid of Construction	$ 48,092,863
Long-Term Debt	$ 772,000
Current Liabilities	
Accounts Payable	$ 2,433,137
Current Portion of Advances in Aid of Construction	326,000
Due to Member	5,132,494
Customer Deposits	296,564
Accrued Taxes	528,581
Accrued Interest	30
Total Current Liabilities	$ 8,716,806
Deferred Liabilities	
Advances in Aid of Construction, Less Current Portion	$ 38,779,760
Total Member's Capital & Liabilities	$ 103,621,558

See Accountants' Compilation Report

Johnson Utilities, L.L.C.
Statement of Income
December 31, 2005

Operating Revenue	
Water Sales	$ 7,193,403
Sewer Fees	5,379,633
Other Revenue	771,444
Total Revenue	$ 13,344,480
Operating Expenses	
Purchased Water	$ 915,377
Purchased Power	624,190
Repairs & Maintenance	255,715
Outside Services	6,278,875
Water Testing	84,945
Rents	13,107
Insurance	62,856
Sludge Removal	68,242
Wastewater Treatment	34,592
Miscellaneous Operating Expense	208,874
Depreciation and Amortization	396,098
Taxes Other Than Income	14,220
Property Taxes	242,910
Total Operating Expenses	$ 9,200,001
Net Operating Income	$ 4,144,479
Other Income (Expenses)	
Interest Income	$ 433,931
Non-Utility Income	1,575
Interest Expense	(66,741)
Total Other Income (Expenses)	$ 368,765
Net Income	$ 4,513,244

See Accountants' Compilation Report

ATTACHMENT 5

The estimated numbers or customers to be served in each of the first five years of water utility service to the area covered by this Application are as follows:

Residential:	Monterra	Montessa	Walker Butte	Total
Year 2007	100			100
Year 2008	460	30	120	610
Year 2009	820	79	300	1199
Year 2010	1180	128	480	1788
Year 2011	1540	147	660	2347

Commercial:	Florence Plaza
Year 2007	0
Year 2008	1
Year 2009	1
Year 2010	1
Year 2011	1

The projected annual water consumption, in gallons, for each of the customer classes in the new area for each of the next five years:

Residential Water Usage:	
in Gallons	
Year 2007	4,724,850
Year 2008	33,546,435
Year 2009	85,472,537
Year 2010	141,131,270
Year 2011	195,372,548

Commercial Water Usage:	
in Gallons	
Year 2007	0
Year 2008	3,650,000
Year 2009	7,300,000
Year 2010	7,300,000
Year 2011	7,300,000

ATTACHMENT 6

Applicant's estimated annual operating revenue and operating expenses for each of the first five years of operation in the new area covered by this Application are as follows:

Water

Operating Revenue		Operating Expenses	
Year 2007	$27,000	Year 2007	$21,600
Year 2008	$200,825	Year 2008	$160,660
Year 2009	$506,680	Year 2009	$405,344
Year 2010	$824,740	Year 2010	$659,792
Year 2011	$1,134,700	Year 2011	$907,760

Wastewater

Operating Revenue		Operating Expenses	
1st Year	$23,100	1st Year	$18,480
2nd Year	$168,510	2nd Year	$134,808
3rd Year	$426,879	3rd Year	$341,503
4th Year	$698,997	4th Year	$559,198
5th Year	$964,185	5th Year	$771,348

ATTACHMENT 7

NAME OF COMPANY	JOHNSON UTILITIES, L.L.C.
ADEQ Public Water System No.	11-136

MONTH/YEAR (Last 13 Months)	NUMBER OF CUSTOMERS	GALLONS SOLD (Thousands)	
September, 2005	0	0	
October, 2005	0	0	
November, 2005	0	0	
December, 2005	0	0	
January, 2006	0	0	
February, 2006	0	0	
March, 2006	0	0	
April, 2006	0	0	
May, 2006	0	0	
June, 2006	155	5150*	
July, 2006	178	5257*	
August, 2006	259	7640*	
September, 2006	285	7056*	
STORAGE TANK CAPACITY (GALLONS)	**NUMBER OF EACH**	**ARIZONA DEPT. OF WATER RESOURCES WELL I.D. NUMBER**	**WELL PRODUCTION (Gallons per Minute)**
500,000	1	55-569177	600
1,000,000	Pending	55-583151	300
		Anthem Well #1 Pending	1300
Other Water Sources in Gallons Per Minute			**None**
Fire Hydrants on System			**YES**
Total Water Pumped Last 13 Months (Gallons in Thousands)			**33,509**

The first customers started on this new system in June. We have had a lot of flushing and testing on this new system.

*Includes construction water sold

Construction Water Sold

NAME OF COMPANY	JOHNSON UTILITIES, L.L.C.
ADEQ Public Water System No.	11-136

MONTH/YEAR (Last 13 Months)	NUMBER OF CUSTOMERS	GALLONS SOLD (Thousands)
June, 2006	155	3,153
July, 2006	178	511
August, 2006	259	2,385
September, 2006	285	3,137

ATTACHMENT 8

MAY 5 2005
OFFICIAL RECORDS OF
PINAL COUNTY RECORDER
LAURA DEAN-LYTLE

WHEN RECORDED RETURN TO:

Town Clerk
Town of Florence
PO Box 2670
Florence, AZ 85232

DATE/TIME: 05/04/05 1356
FEE: $14.00
PAGES: 11
FEE NUMBER: 2005-051154

OPERATING AGREEMENT

DATE: April 20, 2005

PARTIES: (1) JOHNSON UTILITIES, L.L.C.
an Arizona limited liability company
5230 East Shea Boulevard
Suite 200
Scottsdale, AZ 85254

TOWN OF FLORENCE, ARIZONA
an Arizona municipal corporation
PO Box 2670
Florence, AZ 85232

DEFINITIONS:

The following terms used in this Operating Agreement shall have the following meanings:

A.	Town:	Town of Florence, Arizona, an Arizona municipal corporation.
B:	Utility:	Johnson Utilities, L.L.C., an Arizona limited liability company, its successors and assigns.
C:	Utility's Facilities:	Water, effluent, and wastewater lines and related appurtenances.

RECITALS:

1. Pursuant to the Agreement, Utility will commence providing public utility water, effluent water, and wastewater services to those areas of Town within Utility's Certificate of Convenience and Necessity, (CC&N), included but not limited to those areas within the Pulte Corporation Anthem at Merrill Ranch Planned Unit Development which are west of Felix Road as realigned pursuant to the Anthem at Merrill Ranch Development Plan.

2. Pursuant to the Agreement, Town has agreed that, Utility shall be permitted the use of public streets and ways for water and wastewater utility service.

3. Accordingly, the parties hereto desire to enter into this Operating Agreement.

AGREEMENT:

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto hereby agree as follows:

Section 1. Operating Agreement. Town hereby grants Utility, it successors and assigns, the right and privilege to construct, maintain, and operate upon, over, along, across, and under the present and future public rights-of-way (including but not limited to streets, alleys, ways, highways and bridges) located within the present and any future corporate limits of Town, a domestic wastewater collection system as well as a potable water and effluent water delivery system, together with all necessary or desirable appurtenances (including but not limited to wells, well sites, storage, water pumping facilities, wastewater pumping facilities, manholes, transmission mains, distribution mains, collection mains, service lines, fire hydrants, meters and equipment for its own use), for the purpose of supplying potable water, effluent water, and wastewater collection services to Town, its successors, the inhabitants thereof, and all individuals and entities either within or beyond the limits thereof, for all purposes.

A. Notwithstanding the foregoing operating grant, Utility agrees that prior to the construction of any well or well site within the area subject to this Agreement, it will notify the Town of its intent to construct such well or well site and will not commence construction of such well or well site unless and until is has received the approval of Town, which approval shall not be unreasonably withheld. Town shall have 120 days from notification by Utility of its intent to commence construction of any well or well site to issue the Town's approval or disapproval of the proposed well or well site. Utility agrees to protect, indemnify and hold harmless the Town from and against any and all claims, demands, damages, losses, liabilities, fines, charges, penalties, administrative and judicial proceedings, orders and judgments arising out of, resulting from or alleged to have resulted from a violation of the Gila River Indian Community Water Rights Settlement Agreement, the Gila River General Adjudications, or any Federal, State or local law enacted pursuant thereto, as a result of the construction or operation by Utility or its agents, employees or contractors, of any well or well site in violation of this paragraph or after a written notice disapproving such construction or operation has been issued by the Town.

Section 2. Compliance with Town Practice; Map Submitted for Approval; Town Construction Near Utility's Facilities. All construction hereunder shall be performed in accordance with established practices of Town with respect to such public rights-of-way. Before Utilitiy makes any installations in the public rights-of-way, Utility shall submit for approval a map showing the location of such proposed installations to Town. If Town undertakes either

directly or through a contractor any construction project adjacent to or near Utility's facilities operated pursuant hereto, Town shall include in all such construction specifications, bids, and contracts a requirement that, as part of the cost of the project, the contractor or his designee obtain from Utility the temporary removal, relocation, barricading or depressurization of Utility's facilities or equipment, the location of which may create an unsafe condition in view of the equipment to be utilized or the methods of construction to be followed by the contractor. Town shall indemnify and hold Utility harmless from any and all claims, costs, losses, or expenses incurred by Utility as a result of the failure of Town , or it's contractors to comply with said requirements.

Section 3. Construction and Relocation of Utility's Facilities; Payment. All facilities installed or constructed pursuant hereto shall be so located or relocated and so erected as to minimize the interference with traffic, or other authorized uses over, under or through the public rights-of-way. Those phases of construction of Utility's facilities relating to traffic control, backfilling, compaction and paving, as well as the location or relocation of facilities herein provided for shall be subject to regulation by the Town. Utility shall keep accurate records of the location of all facilities in the public right-of-way and furnish them to Town upon request. Upon completion of new or relocation construction of underground facilities in the public right-of-way, Utilitiy shall provide the Town with as-built drawings showing the actual location of the underground facilities in those cases where the actual location differs significantly from the proposed location approved in the permit plans.

A. If Town requires Utility to relocate Utility's facilities, which were located in private easements or rights-of-way obtained by Utility prior to Town's acquisition of the public right-of-way from which the facilities must be relocated, the entire cost of relocating Utility's facilities (including the cost of purchasing a new private easement or right-of-way, if necessary) shall be borne by Town. Town shall also bear the entire cost of all subsequent relocations of the relocated facilities required by Town, until such time as Town condemns or otherwise purchases Utility's private easement or right-of-way. Notwithstanding the last two foregoing sentences, the Town shall only be required to purchase a replacement private easement if the Utility's facilities being relocated cannot reasonably be located within the rights-of-way of the Town or other governmental entity or a free private easement cannot be acquired by the Utility.

B. Except as covered in Paragraph A above, Utility shall bear the entire cost of relocating its facilities, located on public rights-of-way, the relocation of which is necessary for Town's carrying out of a function in the interest of the public health, safety or welfare. Utility's right to retain its facilities in their original location is subject to the paramount right to Town to use its public rights-of-way for all governmental purposes. Notwithstanding the foregoing, if Utility is requested to perform work of a temporary nature on a governmental project to relieve construction problems which could be relieved by other means, the cost of said temporary work will be borne by Town or the contractor working on the governmental project. Governmental purposes include, but are not limited to, the following functions of Town: (1) Any and all improvements to Town streets,

alleys and avenues; (2) establishing and maintaining sanitary sewers, storm drains, and related facilities; (3) establishing and maintaining municipal parks, parking, parkways, pedestrian malls, or grass, shrubs, trees and other vegetation for the purposes of landscaping any street or public property; (4) providing fire protection; (5) collection and disposal of garbage.

C. Town will bear the entire cost of relocating any facilities, the relocation of which is necessitated by the construction of improvements by or on behalf of Town in furtherance of a proprietary function.

D. Where Town's facilities or other facilities occupying a right-of-way under authority of a Town permit or license are already located in the right-of-way and a conflict between Utility potential facilities and the existing facilities can only be resolved expeditiously as determined by the Town's Public Works Director by relocating the existing Town or permittee facilities, Utility shall bear the entire cost of relocating the existing facilities, irrespective of the function they served.

E. If Town participates in the cost of relocating Utility's facilities for any reason, the cost of relocation to Town shall not include any upgrade or improvement of Utility's facilities, as they existed prior to relocation. If required by Federal or State grant guidelines, the cost of relocation of Utility's facilities may be put out for bid by Utility in accordance with Utility's requirements. For the purpose of verifying amounts charged to Town for relocating Utility's facilities, relevant books and records of Utility shall be subject to inspection by duly authorized officers or representatives of the Town at reasonable times.

F. Town will not exercise its right to require Utility's facilities to be relocated in an unreasonable or arbitrary manner, or to avoid its obligations under Section 2. Utility and Town may agree to cooperate on the location and relocation of other facilities at Utility's expense in the public rights-of-way.

Section 4. Restoration of Rights-of-Way. Whenever Utility shall cause any opening or alteration whatever to be made for any purpose in any public right-of-way the work shall be completed with due diligence within a reasonably prompt time, and Utility shall, upon completion of such work, restore the property disturbed to as good condition as it was prior to such openings or alteration. Utility shall bear the full cost of any barricades, signing, rerouting of traffic, or other action or expense which Town shall consider necessary or desirable in the interest of public safety during any such opening or alteration within the public right-of-way. Should Utility fail to restore the property to such condition, Town may make such repairs and Utility shall be responsible for the actual cost of such work. The Town shall give the Utility first right to correct substandard restoration or replacement. If Utility does not proceed with its necessary correction within 30 days, the Town shall have the right to perform the necessary restoration, repair, or replacement, either through its own forces or through a hired contractor, and the Utility agrees to reimburse the Town for *reasonable* expenses in so doing within thirty (30) days after its receipt of the Town's invoice.

Section 5. Operating Agreement Fee. Utility shall pay Town in consideration of the grant of this agreement a sum equal to five percent (5%) of the retail revenues of Utility (excluding governmental impositions such as sales taxes, CAGRD charges) from the sale by it of water, effluent water, and wastewater services within the present and any future corporate limits of Town, as shown by Utility's billing records (the "Fee") This Operating Agreement Fee shall be due and payable quarterly. For the purpose of verifying the amounts payable hereunder, the books and records of Utility shall be subject to inspection by duly authorized officers or representatives of Town at reasonable times. Notwithstanding the above, Town and Utility agree that on or after January 1, 2016, Town may request that the Operating Agreement Fee be increased and Utility will agree to such increase, provided however that Utility shall pay no higher percentage of its retail revenues as and for such fee than the highest fee paid by any other utility provider within the Town as of the time of such request.

Beginning January 1, 2006, payment as described in the preceding paragraphs shall be payable in quarterly amounts within 30 days after the end of each calendar quarter.

Notwithstanding any provision of this Section 5 to the contrary, if at any time during the term of this agreement (1) the Town Council takes action to acquire Utility's facilities or (2) an initiative petition is approved by the voters which would result in the Town's acquisition of Utility's facilities, Utility's obligation to pay the fee provided for in this Section 5 shall immediately terminate, and Utility shall have no further obligation to pay such fees from that date forward; however, this agreement shall in all other respects remain in full force and effect. If Town thereafter officially abandons its efforts to condemn Utility's water and wastewater system, Utility shall resume the payment of fees pursuant to this Section 5 and shall retroactively pay those fees that would have otherwise been payable during the period payments were terminated.

Section 6. Additional Fees. Notwithstanding any provision contained herein to the contrary, Utility shall, in addition to the payment provided in Section 5, pay any occupation tax established by Town, provided the tax is a flat fee per year and that the annual amount of such fee does not exceed the amount of similar fees paid by any other business operated within Town.

Section 7. Term And Effectiveness. This Agreement shall become effective upon acceptance by Utility and Town, and the term of the agreement shall be for a period of twenty-five (25) years commencing from January 1, 2006.

Section 8. Nature of Agreement. This Agreement is exclusive only as to those geographic areas within Utility's CC&N, and shall not be construed to prevent the Town from granting other like or similar grants or privileges to any other person, firm or corporation which may possess a Certificate of Convenience and Necessity within the boundaries of the Town. Utility may not assign this Agreement to any other person, firm or corporation without the prior written consent of Town, which consent shall not be unreasonably withheld.

Section 9. Conflicting Ordinances. To the extent the terms of this Agreement conflict with any ordinance, or any portion of any ordinance, of Town, the terms of this Agreement shall control.

Section 10. Independent Provision. If any section, paragraph, clause, phrase or provision shall be adjudged invalid or unconstitutional, the same shall not affect the validity hereof as a whole or any part of the provisions hereof other than the part so adjudged invalid or unconstitutional.

Section 11. Condemnation; Right Reserved by Town. Town reserves the right and power to purchase and condemn the plant and distribution facilities of Utility within the corporate limits of the Town or any additions thereto, as provided by law. Should Utility offer for sale any or all of its operations and facilities which are subject to this agreement, the Town shall have a right of first refusal with regard to the sale and purchase of such operations and facilities, with the purchase price to be determined by a fair market valuation study conducted by the Town. In the event Utility and Town cannot agree on the fair market valuation, such valuation shall be determined in the manner described by Arizona Revised Statutes ("A.R.S.") 9-515.

Section 12. Indemnification and Hold Harmless.

A. Utility shall defend Town against all claims for injury to any person or property caused by the negligent, reckless or intentional conduct of Utility in the construction or operation of its property and in the event of a determination of liability shall indemnify Town. More particularly Utility, its successors and assigns, does hereby agree to indemnify and hold harmless Town from and against any and all liability, claims, demands, damages, losses, liabilities, fines, charges, penalties, administrative and judicial proceedings and orders, including judgments, remedial actions of any kind and all costs of cleanup actions of any kind, together with expenses related thereto (including but not limited to attorney fees, court costs, cost of appellate proceedings and all claim handling and administrative expenses) relating to, arising out of or resulting from or allegeded to have resulted from Utility's acts, errors, mistakes, omissions, work or services of Utility's agents, employees, contractors, subcontractors or anyone for whose acts they or Utility may be liable in the performance of this Operating Agreement, and whether or not such claims, demands, damages, losses, liabilities, fines, charges, penalties, administrative and judicial proceedings and orders, including judgments, remedial actions of any kind and all costs of cleanup actions of any kind, together with expenses related thereto are caused in part by the passive negligence of the Town, its Council members, agents, officers, officials and employees.

B. This paragraph 12 shall survive the termination or expiration of this Operating Agreement for a period of two (2) years.

Section 13. Insurance Requirements. The Utility, at its own expense, shall purchase and maintain the herein stipulated minimum insurance with companies duly licensed, possessing a current A.M. Best, Inc. rating of "A", or approved and licensed to do business in the State of Arizona with policies and forms satisfactory to the Town. All insurance required herein shall be maintained in full force and effect during the term of this Agreement; failure to do so may, at the sole discretion of the Town, constitute an event of default by the Utility under this Agreement. The Utility's insurance shall be primary insurance, and any insurance or self-insurance maintained by the Town shall not contribute to it. Any failure to comply with the claim reporting provisions of the policies or any breach of an insurance policy warranty shall not affect coverage afforded under the policy to protect the Town. The insurance policies required by this Agreement shall name the Town, its agents, officers, officials, and employees as Additional Insured.

A. General Liability. The Utility shall, at its expense, maintain a policy of comprehensive public liability insurance with a limit of not less than $1,000,000 for each occurrence and with a $1,000,000 General Aggregate Limit. The policy shall include coverage for bodily injury, broad form property damage, personal injury, and blanket contractual coverage including, but not limited to, the liability assumed under the indemnification provisions of this Agreement, which coverage will be at least as broad as Insurance Service Office, Inc., Policy Form CG 000211093(October 2001 version). The coverage shall not exclude X, C, and U. Such policy shall contain a severability of interest provision, and shall not contain a sunset provision or commutation clause, nor any provision which would serve to limit third party action over claims. The Commercial General Liability additional insured endorsement shall be at least as broad as Insurance Service Office, Inc., Additional Insured, Form B, CG2O101185 (October 2001 version).

B. Automobile Liability. The Utility shall, at its expense, maintain a Commercial/Business Automobile Liability Insurance policy with a combined single limit for bodily injury and property damage of not less than $1,000,000.00 each occurrence with respect to any of the Utility's owned, hired and non-owned vehicles assigned to or used in performance of this Agreement. Coverage will be at least as broad as coverage code I, "any auto", Insurance Service Office, Inc., Policy Form CA 00011293, or any replacements thereof. Such insurance shall include coverage for loading and off loading hazards. If hazardous substances, materials or wastes are to be transported, MCS 90 endorsement shall be included and $5,000,000.00 per accident limits for bodily injury and property shall apply.

Section 14. Miscellaneous. Town and Utility hereby expressly agree that the following provision shall survive the termination or expiration of this Agreement.

Upon the termination or expiration of this Agreement, if Utility shall not have acquired and accepted an extension or renewal hereof, it may remove its facilities and system within Town or at its option, may continue operating its facilities and system within additional extension upon, over, along, across and under the public right-of-way within Town, but it shall continue to pay the "Fee" as required in Section 5 until a new

agreement can be effected with the Town or until Utility provides notice to Town that a new agreement will not be pursued or until Utility's facilities are acquired by Town through the exercise of its powers of eminent domain.

Section 15. Town and Utility agree that Town shall provide all solid waste services to all portions of the Anthem at Merrill Ranch Planned Unit Development and to any future areas annexed into the Town.

Section 16. Town and Utility agree that Town shall retain ownership of all existing wells within the property as legally described in the Merrill Ranch Pre-Annexation and Development Agreement dated December 3, 2003. Utility shall retain ownership of the two wells # 55-583151 and # 55-569177 located within the portion of the Anthem at Merrill Ranch Planned United Development which was formerly known as "Rancho Sendero – Mystic Lake".

Section 17. The Town and Utility agree that the Town shall deliver potable water, effluent water and wastewater services to all other areas, located east of the realigned section of Felix Road, including but not limited to the property as legally described in the Merrill Ranch Pre-Annexation Development Agreement dated December 3, 2003.

Section 18. Notices. Any notice required or permitted to be given hereunder shall be in writing, unless otherwise expressly permitted or required, and shall be deemed effective either (i) upon hand delivery to the person then holding the office shown on the attention line of the address below, or, if such office is vacant or no longer exists, to a person holding a comparable office, or (ii) on the third business day following its deposit with the United States Postal Service, first class and certified or registered mail, return receipt requested, postage prepaid, addressed as follows:

To the Town of Florence:	Town of Florence P.O. Box 2670 775 North Main Street Florence, AZ 85232 Attn: Town Manager
To the Utility:	Johnson Utilities, L.L.C. 5230 East Shea Boulevard Suite 200 Scottsdale, AZ 85254 Attn: George H. Johnson Managing Member

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date and year first above written.

Town of Florence, an Arizona municipal corporation

Tom J. Rankin, Mayor — Date: 4-22-05

ATTEST:

Lisa Garcia, Town Clerk

APPROVED AS TO FORM:

James Mannato, Town Attorney

Johnson Utilities, L.L.C., an Arizona limited liability company

Managing Member — Date: 4-22-05

STATE OF ARIZONA)
) ss.
County of Pinal)

On this 22 day of April, 2005, before me, the undersigned officer, personally appeared Tom J. Rankin who acknowledged himself to be the mayor of the TOWN OF FLORENCE, an Arizona municipal corporation, and that he, in such capacity, being authorized so to do, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Stephanie Lamas
Notary Public

My Commission Expires:

July 4, 2008

Notary Public State of Arizona
Pinal County
Stephanie Lamas
Expires July 04, 2008

STATE OF ARIZONA)
) ss.
County of Maricopa)

On this 22 day of Apr. 1, 2005, before me, the undersigned officer, personally appeared George Johnson who acknowledged himself to be the Managing Member of Johnson Utilities, L.L.C., an Arizona limited liability company, and that he, in such capacity, being authorized so to do, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

CHERYL GIBSON
Notary Public - Arizona
MARICOPA COUNTY
My Comm. Exp. 12-23-2008

Notary Public

My Commission Expires:

12-23-2008

ATTACHMENT 9

ARIZONA DEPARTMENT OF WATER RESOURCES
Office of Assured and Adequate Water Supply
500 North Third Street, Phoenix, Arizona 85004
Telephone 602 417-2465
Fax 602 417-2467

October 24, 2005

Mr. Brian Tompsett
Johnson Utilities Company
5230 E. Shea Blvd., Ste. 200
Scottsdale, AZ 85254

Re: Designation of Assured Water Supply (DWR No. 26-401382.0000) Johnson Utilities Company in the Pinal Active Management Area

Dear Mr. Tompsett:

I am pleased to inform you that the Department of Water Resources has approved the application for a Designation of Assured Water Supply for Johnson Utilities Company in the Pinal Active Management Area (Johnson-Pinal). We have enclosed the formal Decision and Order. The Decision and Order includes an itemization of Johnson-Pinal's responsibilities in maintaining the Designation.

Johnson-Pinal's status as a designated water provider demonstrates that Johnson-Pinal is taking a long-term perspective in managing water resources. Johnson-Pinal's commitment to sound water management represents a major contribution to the State's water management goal in the Pinal Active Management Area.

If you have any questions regarding these documents, please contact me at 417-2465, extension 7311.

Sincerely,

Doug Dunham, Manager
Office of Assured Water Supply

DMD/pmn

cc: Mr. Roy Tanney, Arizona Department of Real Estate
Mr. Cliff Neal, Central Arizona Project
Mr. Randy Edmond, Area Director, Pinal AMA
Mr. Michael Pearce, Fennemore Craig

DEPARTMENT OF WATER RESOURCES

BEFORE THE DIRECTOR

IN THE MATTER OF THE APPLICATION OF JOHNSON UTILITIES COMPANY FOR A DESIGNATION AS HAVING AN ASSURED WATER SUPPLY IN THE PINAL ACTIVE MANAGEMENT AREA	**AWS No. 2005-005** **DECISION AND ORDER** **No. 26-401382.0000**

On May 26, 2004, the Department of Water Resources ("Department") received an application from Johnson Utilities Company requesting that the Department designate Johnson Utilities Company's municipal water delivery system in the Pinal Active Management Area ("Johnson-Pinal") as having an assured water supply pursuant to A.R.S. § 45-576(E). On June 15, 2005, the Department determined the application to be complete. On June 18, 2005 and June 25, 2005, the Department gave public notice pursuant to A.R.S. § 45-578 and no objections were filed with the Department.

After receiving the application for designation of Johnson-Pinal as having an assured water supply and reviewing relevant information, including: 1) the hydrologic study for the proposed groundwater supply; 2) information regarding Johnson-Pinal's consistency with the management plan and management goal of the Pinal Active Management Area ("AMA"); 3) information provided by the Arizona Department of Environmental Quality ("ADEQ") regarding the quality of the proposed source of water; and 4) information regarding Johnson-Pinal's financial capability to construct the necessary delivery system, treatment works and storage facilities; the Department finds the following:

1. Johnson Utilities Company is a private water company owned by General Hunt Properties and regulated by the Arizona Corporation Commission ("ACC").
2. Johnson Utilities Company has the legal authority, as granted by the ACC, to deliver water to its customers located within the boundaries of its Certificate of Convenience and Necessity ("CC&N") as indicated on maps on file with the Department. Johnson Utilities Company also has an application for an extension of the CC&N pending before the ACC. *See* Exhibit A, attached.
3. Johnson Utilities Company owns a municipal water delivery system in the Pinal AMA, referenced herein as "Johnson-Pinal."

4. Johnson-Pinal currently serves groundwater through its municipal distribution system to its customers pursuant to Service Area Right Number 56-001538.0000. A.R.S. § 45-492.

5. Johnson-Pinal's current demand for calendar year 2004 was zero acre-feet per year.

6. Johnson-Pinal's committed demand as of calendar year 2004 was zero acre-feet per year.

7. Johnson-Pinal's total projected groundwater demand through calendar year 2007 is estimated at 550.64 acre-feet per year.

8. Johnson-Pinal has demonstrated that 1,595 acre-feet per year of groundwater is physically and continuously available for at least one hundred years. That volume of groundwater exceeds Johnson-Pinal's current demand, committed demand, and projected groundwater demand through 2007 of 550.64 acre-feet per year for 100 years.

9. Historic hydrologic information demonstrates that the current depth-to-static water level within Johnson-Pinal's service area is approximately 146 feet below land surface with a regional decline of 3.13 feet per year.

10. After one hundred years of pumping 1,595 acre-feet per year, the depth-to-static water level within Johnson-Pinal's service area is not expected to exceed 1,100 feet below land surface.

11. Johnson-Pinal groundwater allowance that is consistent with the management goal for the Pinal AMA is 125 gallons per capita per day. A.A.C. R12-15-705(S).

12. Johnson Utilities Company is a member service area of the Central Arizona Groundwater Replenishment District (CAGRD). The May 18, 2000, Member Service Area Agreement between Johnson Utilities Company and the CAGRD ("Agreement") provides that the amount of Excess Groundwater, as defined in the Agreement, delivered by Johnson Utilities Company shall not exceed 5,967 acre-feet per year, which is more than Johnson-Pinal's current demand, committed demand and projected demand through 2007, of 550.64 acre-feet per year of groundwater.

13. The Director has made a determination, which has not expired, that the most recent CAGRD Plan of Operation is consistent with achieving the management goal of the Pinal AMA.

14. As of the date of this decision and order, the CAGRD is in compliance with its groundwater replenishment obligation for the Pinal AMA.

15. Johnson-Pinal is currently regulated as a small municipal provider under the Municipal Conservation Program in the Third Management Plan for the Pinal AMA ("Management Plan"). As of the date the

application was filed, Johnson-Pinal had not been found to be out of compliance with the Management Plan.

16. Johnson-Pinal has constructed the necessary delivery system and storage facilities to satisfy its current demand, committed demand and projected demand through 2007.

17. The water supply that Johnson-Pinal intends to provide its customers currently meets all federal and state water quality standards, based on compliance information provided by ADEQ.

Having reviewed the Findings of Fact, the Department makes the following Conclusions of Law:

1. An annual volume of 1,595 acre-feet per year of groundwater is physically, continuously and legally available to Johnson-Pinal for at least 100 years as prescribed in A.A.C. R12-15-703. This annual volume of groundwater exceeds Johnson-Pinal's current demand, committed demand and projected demand through calendar year 2007 of 550.64 acre-feet per year for 100 years.

2. Pursuant to A.R.S. § 45-576.01(B), as a member service area of the CAGRD, Johnson-Pinal's use of groundwater is consistent with the management goal of the Pinal AMA.

3. The water supply served by Johnson-Pinal currently meets the water quality requirements specified in A.A.C. R12-15-704.

4. In accordance with A.A.C. R12-15-706, Johnson-Pinal meets the standard established for determining consistency with the Management Plan for the Pinal AMA.

5. Johnson-Pinal has satisfied the financial capability criteria prescribed in A.A.C. R12-15-707.

6. Johnson-Pinal has satisfied all the requirements for a designation of an assured water supply.

Having reviewed the Conclusions of Law, the Department hereby issues this Decision and Order designating Johnson-Pinal as having an assured water supply, subject to the following conditions:

1. Upon ACC approval of Johnson Utilities Company's application to extend its CC&N, the expanded boundaries are included in this designation of assured water supply.

2. Johnson Utilities Company shall submit evidence of ACC approval of its pending application to extend its CC&N within 30 days of receipt of the ACC Decision.

3. The Department reserves the right under A.A.C. R12-15-709(A) to periodically review and modify the designation for good cause as conditions warrant.

4. Pursuant to A.A.C. R12-15-709(A), the Department may, at any time revoke this designation if the findings of fact or the conclusions of law upon which the designation is based change or are invalid, or if an assured water supply no longer exists.

5. The Department's determination that an assured water supply exists for Johnson-Pinal is based on its analysis of the water supplies pledged by Johnson-Pinal.

6. Pursuant to A.A.C. R12-15-704, Johnson-Pinal shall satisfy any state water quality requirements established for its proposed use after the date of this designation.

7. Johnson-Pinal shall annually provide to the Department the following information for the previous calendar year in the manner prescribed in A.A.C. R12-15-711:

   a. The estimated future demand of platted, undeveloped lots located in Johnson-Pinal's service area.

   b. The projected demand at build-out for customers with which Johnson-Pinal has entered into a notice of intent to serve agreement.

   c. A report regarding Johnson-Pinal's compliance with water quality requirements.

   d. The depth-to-static water level of all wells from which Johnson-Pinal withdrew water.

   e. Any other information requested by the Director to determine whether Johnson-Pinal continues to meet all the requirements necessary to maintain this designation of assured water supply.

IT IS HEREBY ORDERED THAT JOHNSON UTILITIES COMPANY'S SERVICE AREA LOCATED WITHIN THE PINAL AMA BE DESIGNATED AS HAVING AN ASSURED WATER SUPPLY.

DATED this 14th day of October, 2005.

Herbert R. Guenther
Director
Arizona Department of Water Resources

A copy of the foregoing

Decision and Order mailed by certified mail this 24th day of October, 2005, to the following:

Certified Mail No. 7003 3110 0003 3245 0361

Sent by: Norma J. Coupaud
Norma J. Coupaud

Brian Tompsett
Johnson Utilities Company
5230 E. Shea Blvd., Ste. 200
Scottsdale, AZ 85254

First class mail copies to:

Michael J. Pearce
Fennemore Craig
3003 North Central Avenue, Ste. 2600
Phoenix, AZ 85012

Mr. Roy Tanney
Arizona Department of Real Estate
2910 N. 44th Street
Phoenix, AZ 85018

Mr. Cliff Neal
Central Arizona Groundwater Replenishment District
P.O. Box 43020
Phoenix, AZ 85080

Mr. Randy Edmond
Pinal AMA
1729 N. Trekell Rd., Suite 105
Casa Grande, AZ 85222

AWS No. 2005-005
No. 26-401382.0000

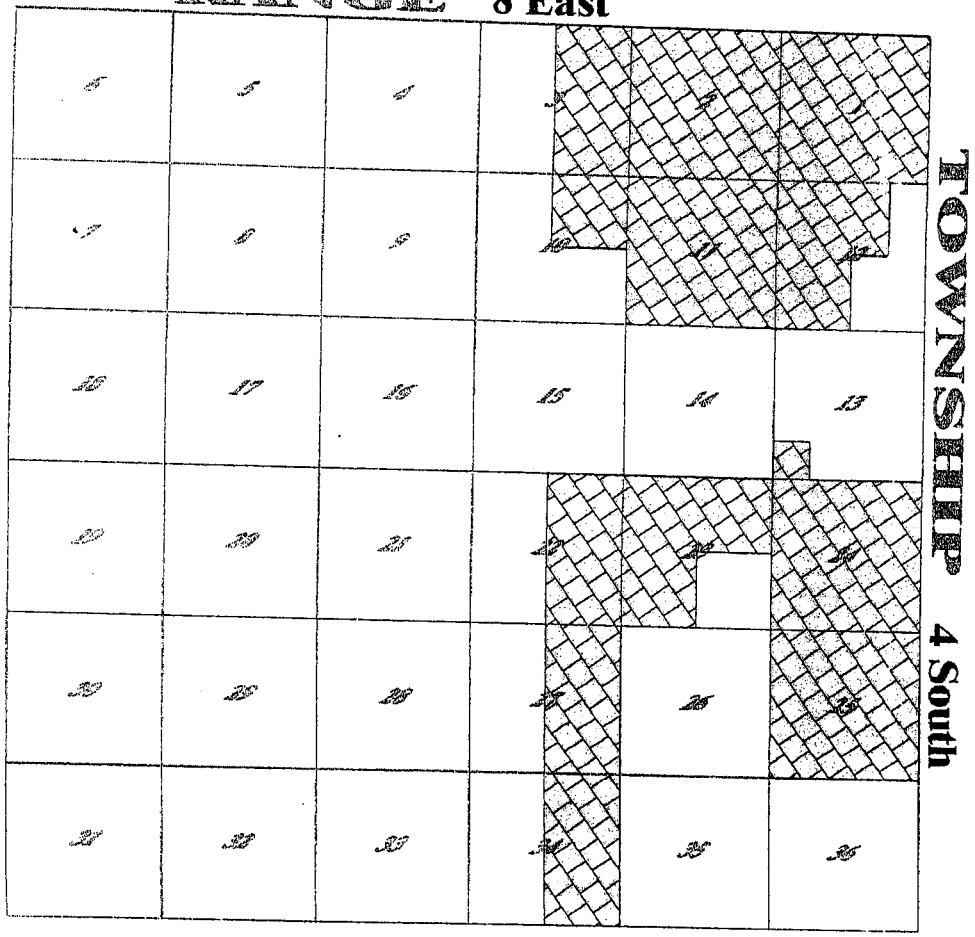
EXHIBIT A: Johnson Utilities existing CC&N and pending CC&N expansion

(Maps attached as following two pages)

Map No. 51

COUNTY: *Pinal*

RANGE 8 East



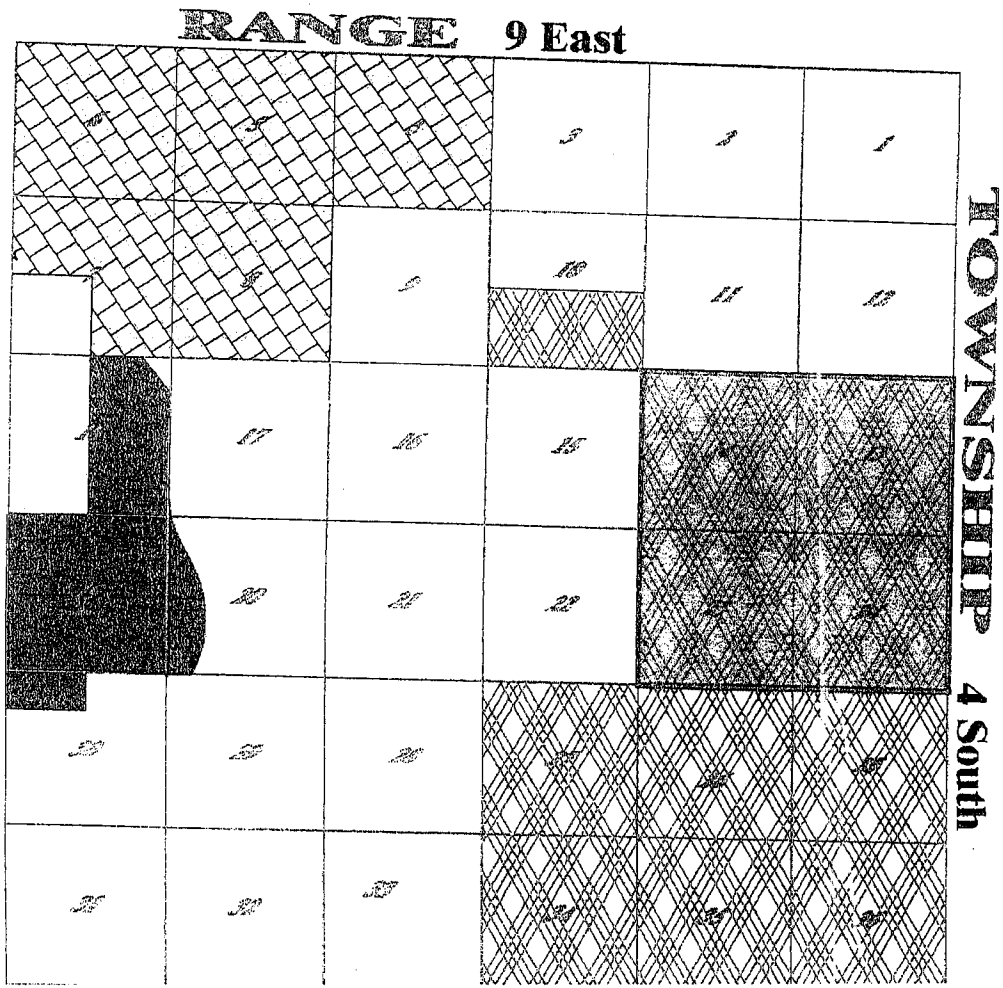
WS-2987 (6)
Johnson Utilities Company

Sewer

TRASSE 22 APR 2003

Map No. 12

COUNTY: *Pinal*



C-0005 (4) Sewer
City of Florence (Nonjurisdictional)

WS-2987 (6) Sewer
Johnson Utilities Company

Johnson Utilities Company
Docket No. WS-2987-04-288
Application for Extension for Water & Sewer

ATTACHMENT 10

Town of Florence
775 N. Main St.
P.O. Box 2670
Florence, AZ 85232

(520) 868-7500
fax (520) 868-7501
TDD (520) 868-7502
www.town.florence.az.us

TOWN SERVICES

Building Inspection
868-7556

Finance
868-7624

Fire
868-7609

Grants
868-7554

Library
868-0788

Municipal Court
868-7514

Personnel
868-7553

Parks & Recreation
868-4835

Planning & Zoning
868-7540

Police
868-7681

Public Works
868-7620

Senior Center
868-7622

Town Hall
868-7500

Town Manager's Office
868-7558

Utility Billing
868-7680

RECEIVED JUL 12 2006

July 10, 2006

Brian P. Tompsett
Johnson International, Inc.
5230 E. Shea Boulevard, Suite 200
Scottsdale, AZ 85254

RE: WATER AND SEWER SERVICE TO WALKER BUTTE

Dear Mr. Tompsett:

The majority of the Walker Butte development is located within the Johnson Utilities CC&N areas for water and wastewater service. A small portion of the project (approximately 400 acres) is located immediately adjacent to but outside Johnson Utilities CC&N. Under these circumstances, the town supports Johnson Utilities to provide water and wastewater services to the balance of the Walker Butte area.

Even though the site is within the town limits of Florence, Florence supports Johnson Utilities's service of sewer and water to the project under our cooperative agreements for utility service. Please feel free to contract with Walker Butte for the utility services.

Please feel free to contact me with questions or comments.

Sincerely,

Himanshu Patel
Town Manager

cc: James Mannato, Town Attorney
Wayne Costa, Public Works Director
John Di Tullio, Gallagher & Kennedy

Town of Florence
775 N. Main St.
P.O. Box 2670
Florence, AZ 85232

(520) 868-7500
fax (520) 868-7501
TDD (520) 868-7502
www.town.florence.az.us

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868-4835

Planning & Zoning
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Police
868-7681

Public Works
868-7620

Senior Center
868-7622

Town Hall
868-7500

Town Manager's Office
868-7558

Utility Billing
868-7680

July 10, 2006

RECEIVED JUL 11 2006

Brian P. Tompsett
Johnson International, Inc.
5230 E. Shea Boulevard, Suite 200
Scottsdale, AZ 85254

RE: WATER AND SEWER SERVICE TO BARCLAY GROUP'S PROJECT AT SWC of HUNT HIGHWAY AND ATTAWAY ROAD

Dear Mr. Tompsett:

I understand that representatives of the Barclay Group have discussed having Johnson Utilities provide sewer and water service to their property located at the south west corner of Hunt Highway and Attaway Road (a portion of the Northeast quarter of Section 36 and a portion of the southeast quarter of Section 25, Township 4 South, Range 8 East).

Even though the site is within the town limits of Florence, Florence supports Johnson's service of sewer and water to the project under our cooperative agreements for utility service. Please feel free to contract with Barclay Group for the utility services.

Please feel free to contact me with questions or comments.

Sincerely,

Himanshu Patel
Town Manager

cc: James Mannato, Town Attorney
Wayne Costa, Public Works Director
Kay Bigelow, Barclay Group

ATTACHMENT 11

OCT 1 2 2006

SUNRISE ENGINEERING

Date: September 28, 2006

To: Cindy
Johnson Utilities, INC.
5230 E. Shea Boulevard
Scottsdale, AZ 85254
Fax (480) 483-7908
Phone (480) 998-3300

Subject: **Request for Service, MONTESSA project – *SEI Project No. 01691***

Dear Cindy,

The purpose of this submittal package is to be included in the expansion of the Johnson Utility Service area along with the Monterra Project. This letter will serve as the **Request for Service** for the Montessa project which is located across Attaway Road from the Monterra project.

For this project we have an approved pre-plat only with preliminary water and sewer reports. The preliminary water and sewer report state that the utility services will be provided by the Town of Florence. The final water and sewer reports will reflect Johnson Utility ownership as well as requirements. Construction drawings should be completed within the next year but they have not been started yet. Much of the information requested is included on the pre-plat and is not repeated here. The following information has been provided:

1. Provided on pre-plat:
    a. Acreage and Location
    b. Legal Description

2. Items not provided elsewhere:
    a. Approximate Start/End Date:
        Construction 2008-2009
    b. We are requesting water and sewer service
    c. Estimated number of customers is 382 (147 lots at 2.6 people / lot)

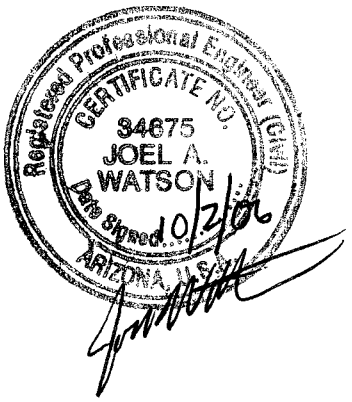
3. Additional items included with this letter:
    a. Pre-plat
    b. Preliminary Water and Sewer Report
    c. Preliminary Engineer's Cost Estimate for water and sewer
    d. Master Utility Agreement.

2152 SOUTH VINEYARD, SUITE 123 · MESA, ARIZONA 85210 · **TEL** 480.768.8600 · **FAX** 480.768.8609 *www.sunrise-eng.com*

Please call if you have any questions or need additional information.

Sincerely,
SUNRISE ENGINEERING, INC.

Joel A. Watson, P.E.
Principal / Project Manager



B&B 2, LLC

September 25, 2006

Johnson Utility Company
C/o Mr. Brian Tompsett
5230 E. Shea Blvd.
Scottsdale, AZ 85254

Re: **Montessa** Request for Wastewater Service for 143 lots located just South of the Southwest Corner of Hunt Hwy. & Attaway Road, in Florence, AZ.

Dear Brian:

Please accept this letter from B&B 2, LLC as an official request for Water and Wastewater service. Our project is located approximately 1/4 mile South of Hunt Highway, on the West side of Attaway Road in Florence, Arizona. We understand that our property is currently adjacent to your existing CC&N for wastewater. Furthermore, it is our understanding that your company is willing and able to service our site, subject to approvals from ADEQ and the ACC for expansion of your existing CC&N.

We look forward to working together to complete the Water and Wastewater service for Montessa. If you require any additional information from us, please call me at (480) 929-0444. I will be happy to assist you in any way possible.

Sincerely,

Bryan Morganstern
B&B 2, LLC

McRae
GROUP of COMPANIES

"The Power and Rewards of Vision"

RECEIVED OCT 26 2004

October 21, 2004

Mr. Brian Thompsett, P.E.
JOHNSON INTERNATIONAL INC
5230 EAST SHEA BLVD SUITE 200
SCOTTSDALE, AZ 85254

RE: Request for Wastewater Service for *Walker Butte* in Pinal County, Arizona.

Dear Brian:

Walker Butte 300, L.L.C., Walker Butte 500, L.L.C., Walker Butte 700, L.L.C., and Hunt & Hooper, L.L.C. as the owners (or buyers under pending contracts for purchase) of approximately 1680+/- acres of property located in Pinal County, Arizona, and currently known and being developed as *Walker Butte*, requests providing of wastewater service by Johnson Utilities. As it is our understanding some or all of this property (as shown on the attached vicinity map) is not currently within approved service area for Johnson Utilities Wastewater plan, we would ask Johnson Utilities take necessary action to have all of this area included in its authorized service area.

In addition to a vicinity map, our engineer, United Engineering Group (UEG), has or is forwarding you a current land use conceptual plan defining potential occupancy of this project, and will provide any additional needed information upon request.

Please advise us of timing and costs, if any, associated with this request. Once this property has been included in your area, we will work with you to enter into a service agreement.

Please copy Scott Lenz of UEG with all communications on this matter, at: 4505 E Chandler Blvd., Suite 170, Phoenix, AZ 85048-7690 Tel: 480-705-5372 ext100; Fax: (480) 705-5376; E-Mail: slenz@unitedeng.com.

8800 N. Gainey Center Drive | Suite 255 | Scottsdale | Arizona 85258
480-609-1200 | fax 480-609-1130 | www.ronmcrae.com

Should you have any further questions, please contact Scott Lenz or the undersigned. Thank you for your assistance.

Sincerely,

WALKER BUTTE 300, L.L.C.,
WALKER BUTTE 500, L.L.C.,
WALKER BUTTE 700, L.L.C., and
HUNT & HOOPER, L.L.C.
By: RMG Real Estate Services II, L.L.C., its Administrator

By: _____
Ronald H. McRae, Member

Cc: Scott Lenz, United Engineering Group

Walker Butte
Hunt Hwy & Hooper, Perry

12666
15629
16601
16604
16608

SEC.
TN. 4S
RG. 8E
SCALE 2" 1 MILE

PINAL COUNTY ASSESSOR

11-25-1999

200 - 24

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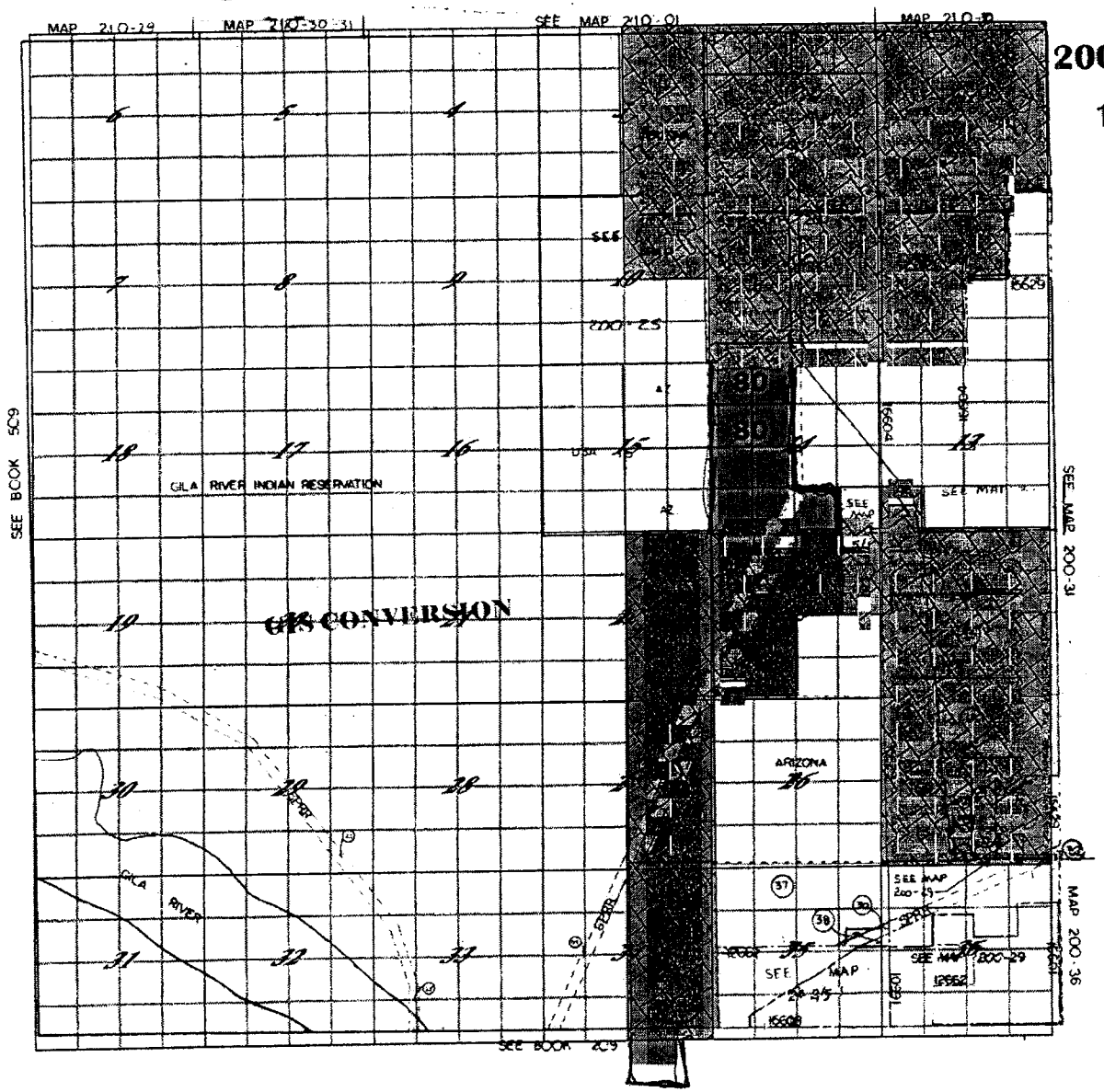


WS-2987 (6)
Johnson Utilities Company

Sewer

Seattle Ridge Investors, LLC

October 13, 2006

Mr. Brian Tompsett
Johnson Utilities
5230 E. Shea Boulevard
Scottsdale, AZ 85254

Re: Request for CC&N Extension

Dear Mr. Tompsett:

This letter is to serve as a request for Johnson Utilities to extend its CC&N to include a portion of the Monterra Master Planned Community known as Monterra South, within Johnson Utilities' water and sewer service area in Florence, Arizona. Monterra South master plat and final plats have been approved by the Town of Florence and are recorded. Attached are copies of the Monterra Master Plan, an ALTA survey, and water and sewer improvement plans for Monterra S.

If you have any questions or need additional information, please contact Steve Tomita of Omega Management Services, Inc. at 480-947-5100 ext. 378.

Sincerely,

Seattle Ridge Investors, LLC,
an Arizona limited liability company

By: W John Management LLC,
a Delaware limited liability company
Its: Manager

By: _____
W. John Nicholson, Member

View Investors, LLC

October 12, 2006

Mr. Brian Tompsett
Johnson Utilities
5230 E. Shea Boulevard
Scottsdale, AZ 85254

Re: Request for CC&N Extension

Dear Mr. Tompsett:

This letter is to serve as a request for Johnson Utilities to extend its CC&N in order to include portions of the Monterra Master Planned Community known as Monterra North and Monterra East, within Johnson Utilities' water and sewer service area. These properties are future development tracts and improvement plans have not yet been prepared. Attached are copies of the Monterra Master Plan and the ALTA survey for each property.

If you have any questions or need additional information, please contact Steve Tomita of Omega Management Services, Inc. at 480-947-5100 ext. 378.

Sincerely,

View Investors, LLC,
an Arizona limited liability company

By: Miller Holdings Management, LLC,
an Arizona limited liability company
Its: Manager

By:_____
Larry L. Miller, Manager

ATTACHMENT 12

Water Distribution Master Plan For Monterra

Prepared by Otak, Inc.
51 W. Third Street, Suite 201
Tempe, AZ 85281
(480) 557-6670

December 2004

Otak Project No. 12633

KENNETH A. NELSON, P.E.

Existing Conditions

The proposed Monterra private, residential development is on approximately 850 acres located in a portion of Sections 29, 31 and 32, T4S, R9E and Section 6, T5S, R9E of the Gila & Salt River Base and Meridian in Pinal County, Arizona. The site is bounded by Attaway Road to the west. Hunt Highway is located approximately 800 feet to the north and the Gila River is directly south of the site (See Figure 1 – *Vicinity Map).* The site presently consists of 29 irrigated farms of approximately 30 acres each.

Information regarding existing and proposed waterlines, pumps, wells, and water rights was gathered and reviewed for this study. Prior to the development of future water infrastructure, the site water source will utilize an existing water well located in the NW ¼ of Section 32, along the east property boundary of the site.

Site topography was obtained by ground survey methods and mapping was provided by M2 Group, Inc. The site topography is gently terrace sloping from the north/northeast to the south/southwest at an average grade of approximately 0.6%.

Design Flows

An *average* daily water supply is the basis for determining project water demands. Water demand criteria was determined from information provided by the Town of Florence Water System Guidelines. The total number of proposed single-family lots located in Monterra (3,734 dwelling units) was combined with the demand for the two proposed school sites to determine a total average daily flow for the project system.

An average daily demand of 100 gallons per capita (gpcpd) was used for residential service. The total residential demand was calculated to be 270 gallons per day (gpd) using the per dwelling unit (DU) use and 2.7 persons per DU. An average daily demand of 1,500 gallons per acre per day was used for each proposed school site. The school sites have areas of 18.0 acres in Phase 1 and 12.8 acres in Phase 2, which result in a calculated average daily demand of 46,200 gpd.

The total average daily demand for the site is calculated to be 1,008,180 gpd, with a total average peak flow rate of 700.1 gallons per minute (gpm). An average daily flow of 0.188 gpm per dwelling unit was used for this analysis of the proposed water system for the project. This analysis also includes a fire flow capacity of 1,000 gpm for 2 hours for residential and 3000 gpm for 2 hours for each school site.

The pipe networks were identified and sized as 8" and 12" diameter pipe sections. The intersections and ends of the pipe sections were labeled and numbered as nodes. One fixed grade node (FGN) was labeled as a reservoir (R-1 see Figure 3). The entire system layout is shown in Figure 3 - Water Distribution System. The map includes pipe junction nodes and pipe section labels.

Hydraulic Modeling

The KYPIPE2000 computer software was used to evaluate the proposed water distribution system for the project. Design flows for the site are based on collective data for a typical day within existing developments. An Extended Period Simulation (EPS) was used as a 24-hour cycle to account for water demands throughout a complete day. Within this cycle, 2-hour increments are used as a basis for changing the water demand for each dwelling unit.

Figure I in Appendix B displays the hourly variations in water demand throughout a 24-hour cycle or one complete day.

The analysis of the project system begins at time zero and ends at time 24. Using two hour increments, the model simulation begins at 12:00 a.m. and runs a complete 24-hour cycle through 12:00 a.m. of the next day. As shown on Figure I in Appendix B, a *minimum* daily demand factor of approximately 5% of the average demand was used at time zero or 12:00 a.m., for example. The demand factors or percentages were estimated and simulated for each two hour increment with the peak water demand occurring at approximately 9:00 a.m. and then again at approximately 8:00 p.m. A peak hourly flow is approximately 240% of an average hourly flow.

Using the appropriate demand factors, a normal day of use can be simulated consistently with actual real-time measured values. The minimum, average, and peak flows are analyzed based on minimum and maximum allowable rates of flow, pressure, and velocity. Residential, commercial, and school site fire flows are also used in conjunction with the peak water demand time frame to test and validate the proposed distribution system. Any deficiencies in the water system pipe sizes were located, analyzed, and revised as needed to provide the most efficient design.

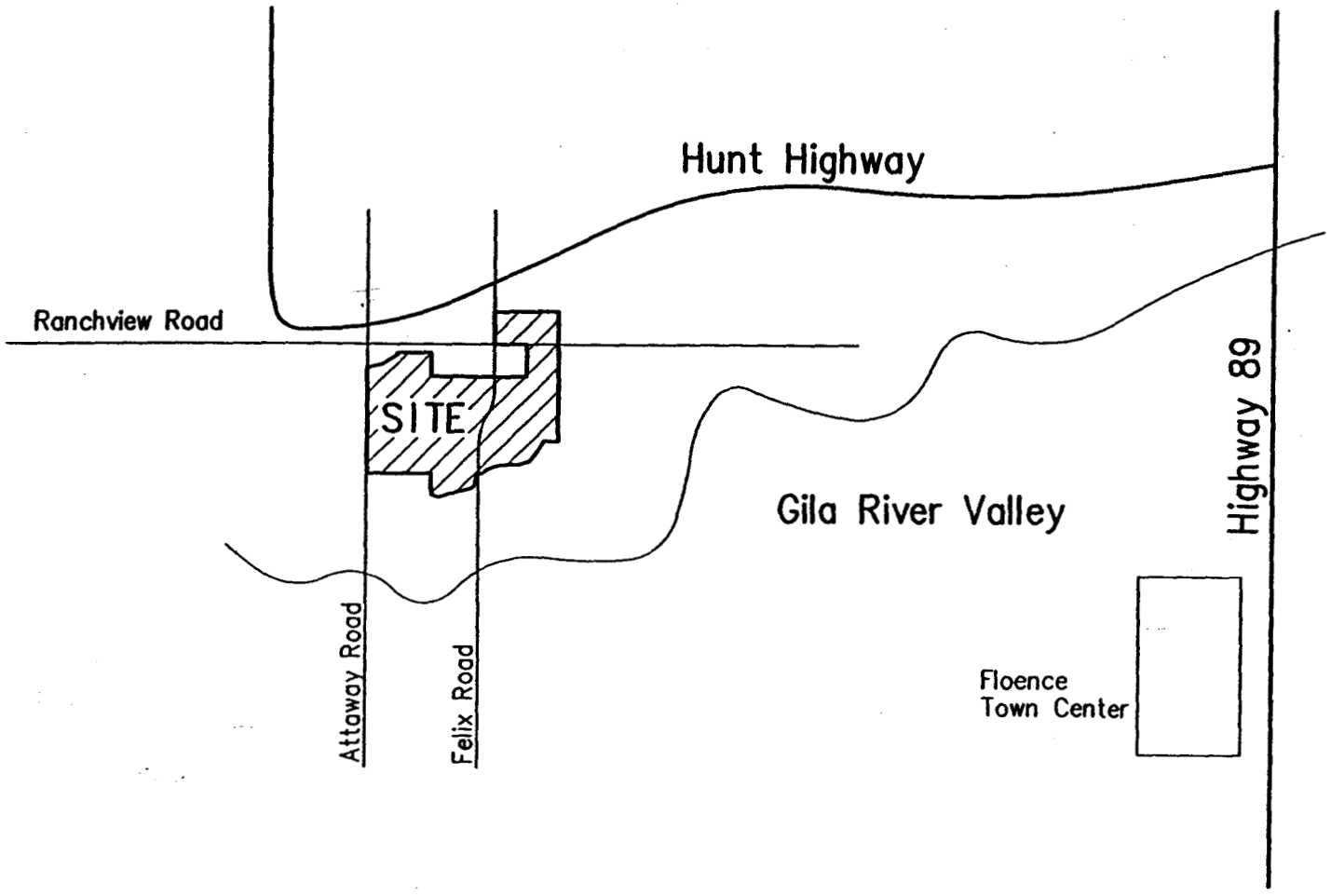
Fire flows were analyzed during the peak water demand (8:00 p.m.) at one location to validate the water distribution design for the worst case scenario. A fire flow of 3,000 gpm for 2-hours was analyzed to occur at junction J-1.

The recommended pressure at any junction node during a daily water demand is between approximately 45 psi and 95 psi. The maximum recommended pipe velocities were kept below 5 feet per second, keeping headloss to a maximum of approximately 10 feet per 1,000 feet of pipe. During a fire flow event, the minimum pressure at any junction node in the system is 20 psi.

The KYPIPE2000 output validates the proposed "Monterra" water distribution system by providing minimum, average, and peak demand factors applied as well as fire flows occurring during the peak water demand.

Conclusions

The proposed system of 8" and 12" diameter waterlines looped through and around the site will be adequate to provide peak hourly water demands with fire flow conditions. The minimum and maximum pressures at junction nodes are within the recommended limits. The maximum head loss encountered in this analysis is less than 10 ft./1,000 ft. under fire flow conditions. Pipe velocities during the analysis were below the maximum of 5 feet per second. Minimum pressures during fire flow conditions are well above the minimum pressure of 20 psi throughout the system.



N.T.S.

TEM: DARINO 12/23/2004 11:16am --> T:\PROJECT\12600\12633\REPORTS\FIG1-VICINITY.DWG

otak Incorporated
51 W Third St., Suite 201
Tempe, Arizona 85281
Phone: (480) 557-6670
FAX: (480) 557-6506
Internet: WWW.Otak.COM

Monterra South

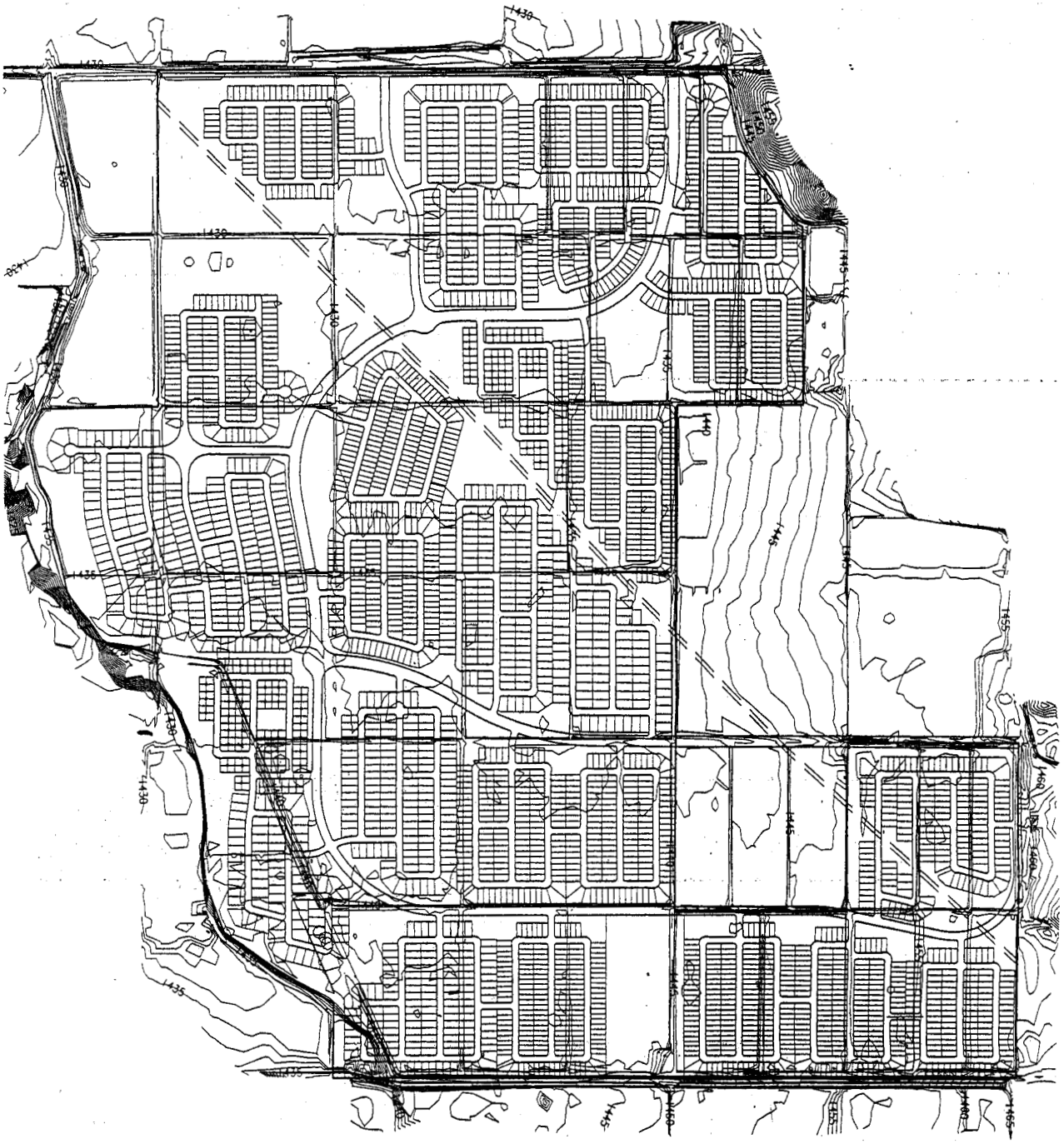
Preliminary
Drainage
Report

VICINITY MAP

Date:
Drawn: DSO Checked:
Project No.: 12633
File No.: VICINITY

FIGURE 1

Sheet No.:



N.T.S.

MONTERRA SOUTH

Preliminary Drainage Report

Topography Map

Project No.

Figure 2

Sheet No.

otak

NO.	DATE	BY	Checked & Approved	REVISIONS
				Initial Issue by :

Appendix A

KYPIPE2000 Hydraulic Analysis Output

RESULTS FOR NORMAL CONDITIONS

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* * * * * * * * * *  K Y P I P E 4  * * * * * * * * * *
*                                                       *
*    University of Kentucky Network Modeling Software   *
*                                                       *
*              Copyrighted by KPFS 1998                 *
*             Version 2.000 - 04/24/2003                *
*                                                       *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: . Thu Dec 23 08:18:00 2004

INPUT DATA FILENAME --------------
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TABULATED OUTPUT FILENAME --------
T:\project\12600\12633\Reports\Water\KY_PIP~1\monterra.OT2
POSTPROCESSOR RESULTS FILENAME ---
T:\project\12600\12633\Reports\Water\KY_PIP~1\monterra.RS2

SUMMARY OF ORIGINAL DATA

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig
METERED FLOW ..... = gallons
POWER COST ..... = 0.050 $/kW-Hr

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	J-18	J-164	504.86	11.65	120.0000	0.00
P-10	J-7	J-8	414.32	7.98	120.0000	0.00

P-100	J-68	J-69	669.75	7.98	120.0000
0.00					
P-101	J-69	J-68	646.79	7.98	120.0000
0.00					
P-102	J-70	J-66	935.73	7.98	120.0000
0.00					
P-103	J-70	J-71	175.99	7.98	120.0000
0.00					
P-104	J-72	J-62	834.98	7.98	120.0000
0.00					
P-105	J-72	J-76	729.74	7.98	120.0000
0.00					
P-106	J-73	J-2	536.48	11.65	120.0000
0.00					
P-107	J-74	J-73	227.19	7.98	120.0000
0.00					
P-108	J-74	J-75	1694.81	7.98	120.0000
0.00					
P-109	J-76	J-77	332.82	7.98	120.0000
0.00					
P-11	J-3	J-10	305.53	7.98	120.0000
0.00					
P-110	J-75	J-76	291.78	7.98	120.0000
0.00					
P-111	J-75	J-78	766.94	7.98	120.0000
0.00					
P-112	J-78	J-74	589.02	7.98	120.0000
0.00					
P-113	J-77	J-78	668.40	7.98	120.0000
0.00					
P-114	J-77	J-81	298.04	7.98	120.0000
0.00					
P-115	J-79	J-72	299.31	7.98	120.0000
0.00					
P-116	J-79	J-80	641.63	7.98	120.0000
0.00					
P-117	J-81	J-82	1080.92	7.98	120.0000
0.00					
P-118	J-80	J-81	459.91	7.98	120.0000
0.00					
P-119	J-82	J-162	732.83	7.98	120.0000
0.00					
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0.00					
P-120	J-80	J-82	311.86	7.98	120.0000
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0.00					
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0.00					
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0.00					
P-124	J-86	J-84	766.49	7.98	120.0000
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P-125	J-84	J-29	1039.72	7.98	120.0000
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	P-128	J-83	J-89	1288.50	7.98	120.0000
0.00						
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0.00						
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P-232	J-152	J-153	617.36	7.98	120.0000
0.00					
P-233	J-150	J-152	746.09	7.98	120.0000
0.00					
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0.00					
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0.00					
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P-245	J-159	J-161	209.08	11.65	120.0000
0.00					
P-246	J-162	J-79	310.87	7.98	120.0000
0.00					
P-247	J-162	J-163	257.62	7.98	120.0000
0.00					
P-248	J-166	J-26	1919.10	7.98	120.0000
0.00					
P-25	J-18	J-3	606.88	11.65	120.0000
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P-250	J-166	J-26	780.03	7.98	120.0000
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0.00					
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0.00						
	P-31	J-22	J-21	969.52	7.98	120.0000
0.00						
	P-32	J-20	J-22	700.66	7.98	120.0000
0.00						
	P-33	J-23	J-22	1108.03	7.98	120.0000
0.00						
	P-34	J-23	J-24	275.85	7.98	120.0000
0.00						
	P-35	J-24	J-8	158.89	7.98	120.0000
0.00						
	P-36	J-25	J-37	486.64	11.65	120.0000
0.00						
	P-37	J-25	J-32	865.58	7.98	120.0000
0.00						
	P-38	J-27	J-47	430.18	11.65	120.0000
0.00						
	P-39	J-28	J-25	273.23	11.65	120.0000
0.00						
	P-4	J-3	J-4	279.76	7.98	120.0000
0.00						
	P-40	J-28	J-1	212.41	11.65	120.0000
0.00						
	P-41	J-33	J-166	564.58	7.98	120.0000
0.00						
	P-42	J-29	J-83	275.30	7.98	120.0000
0.00						
	P-43	J-30	J-73	241.85	7.98	120.0000
0.00						
	P-44	J-32	J-26	269.53	7.98	120.0000
0.00						
	P-45	J-33	J-34	647.33	7.98	120.0000
0.00						
	P-46	J-32	J-33	484.75	7.98	120.0000
0.00						
	P-47	J-34	J-36	595.52	7.98	120.0000
0.00						
	P-48	J-34	J-31	984.00	7.98	120.0000
0.00						
	P-49	J-35	J-27	226.45	7.98	120.0000
0.00						
	P-5	J-4	J-5	440.79	7.98	120.0000
0.00						
	P-50	J-31	J-35	270.01	7.98	120.0000
0.00						
	P-51	J-36	J-35	661.17	7.98	120.0000
0.00						

	P-52	J-31	J-36	383.40	7.98	120.0000
0.00						
	P-53	J-37	J-27	302.82	11.65	120.0000
0.00						
	P-54	J-37	J-39	221.62	7.98	120.0000
0.00						
	P-55	J-39	J-38	781.42	7.98	120.0000
0.00						
	P-56	J-38	J-41	286.20	7.98	120.0000
0.00						
	P-57	J-40	J-39	281.70	7.98	120.0000
0.00						
	P-58	J-38	J-40	504.28	7.98	120.0000
0.00						
	P-59	J-41	J-42	1053.82	7.98	120.0000
0.00						
	P-6	J-5	J-7	687.54	7.98	120.0000
0.00						
	P-60	J-41	J-44	149.92	7.98	120.0000
0.00						
	P-61	J-43	J-40	1076.94	7.98	120.0000
0.00						
	P-62	J-42	J-46	931.66	7.98	120.0000
0.00						
	P-63	J-44	J-43	145.66	7.98	120.0000
0.00						
	P-64	J-42	J-44	636.02	7.98	120.0000
0.00						
	P-65	J-45	J-51	661.06	11.65	120.0000
0.00						
	P-66	J-47	J-59	704.83	11.65	120.0000
0.00						
	P-67	J-46	J-43	145.44	7.98	120.0000
0.00						
	P-68	J-46	J-49	152.69	7.98	120.0000
0.00						
	P-69	J-49	J-48	468.23	11.65	120.0000
0.00						
	P-7	J-5	J-6	392.22	7.98	120.0000
0.00						
	P-70	J-48	J-47	541.61	11.65	120.0000
0.00						
	P-71	J-48	J-58	195.35	7.98	120.0000
0.00						
	P-72	J-51	J-49	338.97	11.65	120.0000
0.00						
	P-73	J-50	J-51	407.48	7.98	120.0000
0.00						
	P-74	J-50	J-53	322.93	7.98	120.0000
0.00						
	P-75	J-53	J-54	145.84	7.98	120.0000
0.00						
	P-76	J-52	J-50	674.63	7.98	120.0000
0.00						
	P-77	J-54	J-55	594.41	7.98	120.0000
0.00						

P-78	J-52	J-54	598.56	7.98	120.0000
0.00					
P-79	J-55	J-56	821.69	7.98	120.0000
0.00					
P-8	J-7	J-24	824.09	7.98	120.0000
0.00					
P-80	J-56	J-52	286.48	7.98	120.0000
0.00					
P-81	J-55	J-56	289.31	7.98	120.0000
0.00					
P-82	J-57	J-53	786.23	7.98	120.0000
0.00					
P-83	J-57	J-58	1165.36	7.98	120.0000
0.00					
P-84	J-58	J-57	790.61	7.98	120.0000
0.00					
P-85	J-59	J-85	408.13	11.65	120.0000
0.00					
P-86	J-59	J-69	156.52	7.98	120.0000
0.00					
P-87	J-61	J-63	277.16	7.98	120.0000
0.00					
P-88	J-61	J-64	283.13	7.98	120.0000
0.00					
P-89	J-62	J-73	1088.51	11.65	120.0000
0.00					
P-9	J-8	J-4	667.02	7.98	120.0000
0.00					
P-90	J-60	J-61	658.75	7.98	120.0000
0.00					
P-91	J-63	J-60	1372.62	7.98	120.0000
0.00					
P-92	J-60	J-63	395.26	7.98	120.0000
0.00					
P-93	J-64	J-70	613.31	7.98	120.0000
0.00					
P-94	J-65	J-67	736.81	7.98	120.0000
0.00					
P-95	J-64	J-65	286.75	7.98	120.0000
0.00					
P-96	J-66	J-65	463.66	7.98	120.0000
0.00					
P-97	J-67	J-72	604.28	7.98	120.0000
0.00					
P-98	J-66	J-67	282.65	7.98	120.0000
0.00					
P-99	J-68	J-61	449.84	7.98	120.0000
0.00					

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)

J-1	13.50	1433.80
J-10	4.69	1434.10
J-100	0.00	1438.10
J-101	4.12	1437.40
J-102	0.00	1435.50
J-103	4.31	1437.00
J-104	4.31	1437.10
J-105	4.31	1437.50
J-106	4.88	1433.10
J-107	4.88	1433.20
J-108	4.69	1435.40
J-109	4.88	1435.50
J-11	4.50	1431.50
J-112	4.69	1435.40
J-113	4.88	1436.10
J-114	0.00	1435.90
J-115	8.62	1435.90
J-116	0.00	1460.00
J-117	8.62	1438.80
J-118	8.62	1438.80
J-12	4.69	1433.80
J-120	0.00	1438.00
J-121	8.44	1437.90
J-122	0.00	1435.60
J-123	8.44	1438.30
J-124	8.44	1438.10
J-125	5.25	1438.00
J-126	5.25	1438.20
J-127	5.25	1438.10
J-128	5.06	1438.10
J-129	5.25	1438.30
J-13	4.31	1431.50
J-130	0.00	1440.70
J-131	9.94	1440.20
J-132	0.00	1440.10
J-133	9.94	1440.60
J-134	5.25	1440.90
J-135	9.94	1440.30
J-136	5.25	1441.20
J-137	5.25	1440.40
J-138	5.06	1441.10
J-139	5.06	1441.20
J-14	4.50	1431.30
J-140	7.31	1445.20
J-141	0.00	1445.40
J-142	0.00	1452.00
J-143	7.13	1445.60
J-144	7.31	1449.60
J-145	5.44	1452.60
J-146	5.44	1452.60
J-147	5.62	1449.50
J-148	5.62	1453.10
J-149	0.00	1456.10
J-15	4.31	1431.30
J-150	7.13	1456.00
J-151	5.44	1452.90

J-152	7.31	1456.40
J-153	7.31	1456.20
J-154	0.00	1452.60
J-155	4.88	1451.40
J-156	4.69	1452.20
J-157	4.69	1451.50
J-158	4.69	1454.00
J-159	4.88	1457.40
J-16	4.31	1431.50
J-160	4.69	1454.20
J-161	0.00	1462.10
J-162	2.81	1434.00
J-163	2.81	1433.80
J-164	0.00	1436.90
J-166	8.44	1434.80
J-168	18.75	1441.40
J-17	4.50	1434.00
J-170	0.00	1445.40
J-18	0.00	1433.90
J-19	0.00	1433.70
J-2	0.00	1437.10
J-20	6.75	1441.80
J-21	6.75	1436.60
J-22	6.94	1442.10
J-23	6.75	1441.70
J-24	3.38	1441.60
J-25	0.00	1431.80
J-26	8.25	1434.80
J-27	0.00	1431.40
J-28	0.00	1433.70
J-29	6.75	1433.00
J-3	0.00	1434.10
J-30	5.81	1435.70
J-31	7.13	1431.60
J-32	8.25	1434.70
J-33	8.25	1434.80
J-34	7.13	1432.70
J-35	7.13	1431.70
J-36	7.13	1431.80
J-37	0.00	1431.50
J-38	3.75	1430.20
J-39	3.75	1431.60
J-4	3.56	1439.20
J-40	3.75	1431.40
J-41	3.56	1430.00
J-42	3.75	1429.60
J-43	3.56	1430.00
J-44	3.56	1430.00
J-45	0.00	1429.80
J-46	3.75	1429.90
J-47	0.00	1431.50
J-48	0.00	1431.10
J-49	0.00	1429.90
J-5	3.56	1439.10
J-50	3.56	1429.80
J-51	0.00	1429.80
J-52	3.75	1429.40

J-53	3.56	1429.60	
J-54	3.56	1429.40	
J-55	3.56	1429.40	
J-56	3.56	1429.30	
J-57	10.88	1431.40	
J-58	10.88	1431.20	
J-59	0.00	1432.10	
J-6	3.56	1438.80	
J-60	5.62	1429.50	
J-61	5.44	1430.60	
J-62	0.00	1433.50	
J-63	5.62	1430.50	
J-64	4.12	1430.60	
J-65	4.12	1430.70	
J-66	4.31	1430.60	
J-67	4.31	1430.60	
J-68	5.62	1430.70	
J-69	5.44	1431.40	
J-7	3.56	1439.20	
J-70	4.12	1431.10	
J-71	4.12	1430.70	
J-72	0.00	1433.50	
J-73	0.00	1436.80	
J-74	5.25	1436.90	
J-75	5.25	1433.70	
J-76	5.06	1433.80	
J-77	5.06	1436.80	
J-78	5.06	1437.00	
J-79	2.81	1434.20	
J-8	3.56	1441.80	
J-80	2.81	1434.80	
J-81	3.00	1437.00	
J-82	3.00	1434.70	
J-83	5.81	1433.10	
J-84	6.94	1431.80	
J-85	0.00	1432.10	
J-86	6.75	1432.70	
J-87	6.75	1432.90	
J-88	5.81	1433.00	
J-89	6.00	1435.90	
J-9	4.50	1431.50	
J-90	7.50	1437.20	
J-91	0.00	1438.70	
J-92	7.50	1439.20	
J-93	7.50	1438.70	
J-94	7.50	1439.60	
J-95	3.75	1439.40	
J-96	3.56	1441.20	
J-97	3.75	1441.20	
J-98	3.75	1441.00	
J-99	0.00	1438.90	
R-1	----	1445.70	1595.70

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

ALL CLOSED PIPES ARE NOTED
ALL PIPES WITH PUMPS
NO JUNCTION NODES
MAXIMUM AND MINIMUM PRESSURES = 10
MAXIMUM AND MINIMUM VELOCITIES = 10
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 10

E P S D A T A

TOTAL TIME FOR SIMULATION = 24.000
NORMAL TIME PERIOD FOR CALCULATIONS = 2.000
NORMAL TIME PERIOD FOR TABULATED OUTPUT = 2.000
NORMAL TIME PERIOD FOR POSTPROCESSING FILE = 2.000

EPS OUTPUT SELECTION: THE ABOVE TABULATED OUTPUT OPTIONS ARE INCLUDED WITH THE FOLLOWING EXTENDED PERIOD PRINT OPTIONS

INTERMEDIATE REPORTS (tank status, flow meter, regulating valve, etc.)
TABULATED FOR ALL INTERMEDIATE TIME PERIODS
TABULATED FOR ALL STATUS CHANGES (tanks, pressure switches, etc.)

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 250
NUMBER OF END NODES .....(j) = 164
NUMBER OF PRIMARY LOOPS .....(l) = 86
NUMBER OF SUPPLY NODES .....(f) = 1
NUMBER OF SUPPLY ZONES .....(z) = 1

==========
Time: 0.000

TIME FROM INITIATION OF EPS = 0.0000 HOURS (0 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 12 TRIALS: ACCURACY = 0.00003

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE FLOWRATE NODE

NAME	(gpm)	TITLE
R-1	725.06	

NET SYSTEM INFLOW = 725.06
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 725.06
Time: 0.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 0.0001 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 0.000

TIME FROM INITIATION OF EPS = 0.0001 HOURS (0 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	1000 HL/ (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	72.10	J-161	57.89
J-52	72.06	J-116	58.80
J-54	72.06	J-159	59.93
J-55	72.06	J-152	60.36

J-60	72.02	J-153	60.45
J-42	71.97	J-149	60.49
J-53	71.97	J-150	60.54
J-45	71.89	J-160	61.31
J-50	71.89	J-158	61.40
J-51	71.89	J-148	61.79

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	0.06	P-246	0.00
P-213	0.05	P-54	0.00
P-198	0.05	P-192	0.00
P-254	0.05	P-193	0.00
P-255	0.05	P-79	0.00
P-217	0.04	P-190	0.00
P-244	0.04	P-81	0.00
P-147	0.04	P-91	0.00
P-214	0.04	P-195	0.00
P-106	0.04	P-168	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	0.00	P-246	0.00
P-256	0.00	P-54	0.00
P-213	0.00	P-192	0.00
P-217	0.00	P-193	0.00
P-198	0.00	P-79	0.00
P-254	0.00	P-190	0.00
P-235	0.00	P-81	0.00
P-244	0.00	P-91	0.00
P-147	0.00	P-195	0.00
P-199	0.00	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	36.25	

NET SYSTEM INFLOW = 36.25
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 36.25

==========
Time: 2.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 2.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 2.000

TIME FROM INITIATION OF EPS = 2.0000 HOURS (200 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE HL/ VELO. (ft/s)	1000 (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	72.10	J-161	57.89
J-52	72.05	J-116	58.80
J-54	72.05	J-159	59.92
J-55	72.05	J-152	60.36
J-60	72.01	J-153	60.45
J-42	71.97	J-149	60.49
J-53	71.97	J-150	60.53
J-45	71.88	J-160	61.31

J-51	71.88	J-158	61.40
J-50	71.88	J-148	61.79

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	0.12	P-246	0.00
P-213	0.10	P-54	0.00
P-198	0.10	P-192	0.00
P-254	0.10	P-193	0.00
P-255	0.10	P-79	0.00
P-217	0.08	P-190	0.00
P-244	0.08	P-81	0.00
P-147	0.08	P-91	0.00
P-214	0.08	P-195	0.00
P-106	0.07	P-168	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	0.01	P-246	0.00
P-256	0.01	P-54	0.00
P-213	0.01	P-192	0.00
P-217	0.01	P-193	0.00
P-198	0.01	P-79	0.00
P-254	0.01	P-190	0.00
P-235	0.00	P-81	0.00
P-244	0.00	P-91	0.00
P-147	0.00	P-195	0.00
P-199	0.00	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	72.51	

NET SYSTEM INFLOW = 72.51
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 72.51

==========
Time: 4.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 4.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 4.000

TIME FROM INITIATION OF EPS = 4.0000 HOURS (400 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE HL/ VELO. (ft/s)	1000 (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	72.05	J-161	57.86
J-52	72.00	J-116	58.76
J-54	72.00	J-159	59.90
J-55	72.00	J-152	60.34
J-60	71.96	J-153	60.42
J-42	71.92	J-149	60.46
J-53	71.92	J-150	60.51
J-45	71.83	J-160	61.28
J-51	71.83	J-158	61.37
J-50	71.83	J-148	61.77

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	0.30	P-246	0.00
P-213	0.26	P-54	0.00
P-198	0.25	P-192	0.00
P-254	0.25	P-193	0.00
P-255	0.25	P-79	0.00
P-217	0.21	P-190	0.00
P-244	0.21	P-81	0.00
P-147	0.21	P-91	0.00
P-214	0.19	P-195	0.00
P-106	0.18	P-168	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	0.05	P-246	0.00
P-256	0.05	P-54	0.00
P-213	0.04	P-192	0.00
P-217	0.04	P-193	0.00
P-198	0.03	P-79	0.00
P-254	0.03	P-190	0.00
P-235	0.03	P-81	0.00
P-244	0.02	P-91	0.00
P-147	0.02	P-195	0.00
P-199	0.02	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	181.27	

NET SYSTEM INFLOW = 181.27
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 181.27

==========
Time: 6.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 6.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 6.000

TIME FROM INITIATION OF EPS = 6.0000 HOURS (600 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE HL/ VELO. 1000 (ft/s) (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	71.70	J-161	57.66
J-52	71.66	J-116	58.53
J-54	71.66	J-159	59.70
J-55	71.66	J-152	60.18
J-60	71.62	J-153	60.27
J-53	71.57	J-149	60.30
J-42	71.57	J-150	60.35
J-45	71.48	J-160	61.10
J-51	71.48	J-158	61.18
J-50	71.48	J-148	61.63

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY	PIPE NUMBER	MINIMUM VELOCITY

	(ft/s)		(ft/s)
P-256	0.84	P-246	0.00
P-213	0.73	P-54	0.00
P-198	0.70	P-192	0.00
P-254	0.69	P-193	0.00
P-255	0.69	P-79	0.00
P-217	0.59	P-190	0.00
P-244	0.58	P-81	0.00
P-147	0.58	P-91	0.00
P-214	0.54	P-195	0.00
P-106	0.51	P-168	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	0.35	P-246	0.00
P-256	0.32	P-54	0.00
P-213	0.30	P-192	0.00
P-217	0.26	P-193	0.00
P-198	0.23	P-79	0.00
P-254	0.22	P-190	0.00
P-235	0.18	P-81	0.00
P-244	0.16	P-91	0.00
P-147	0.16	P-195	0.00
P-199	0.15	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	507.54	

NET SYSTEM INFLOW = 507.54
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 507.54

==========
Time: 8.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 8.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 8.000

TIME FROM INITIATION OF EPS = 8.0000 HOURS (800 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE HL/ VELO. (ft/s)	1000 (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	70.43	J-161	56.94
J-54	70.39	J-116	57.67
J-52	70.39	J-159	58.98
J-55	70.39	J-152	59.60
J-60	70.38	J-153	59.70
J-53	70.30	J-149	59.71
J-42	70.30	J-150	59.77
J-45	70.23	J-160	60.42
J-51	70.22	J-158	60.50
J-50	70.22	J-148	61.12

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	1.79	P-246	0.00
P-213	1.55	P-54	0.00

P-198	1.49	P-192	0.00
P-254	1.48	P-193	0.00
P-255	1.48	P-79	0.00
P-217	1.27	P-190	0.00
P-244	1.24	P-81	0.00
P-147	1.24	P-91	0.00
P-214	1.15	P-195	0.00
P-106	1.10	P-168	0.01

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	1.42	P-246	0.00
P-256	1.30	P-54	0.00
P-213	1.22	P-192	0.00
P-217	1.07	P-193	0.00
P-198	0.93	P-79	0.00
P-254	0.92	P-190	0.00
P-235	0.74	P-81	0.00
P-244	0.66	P-91	0.00
P-147	0.66	P-195	0.00
P-199	0.61	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	1087.59	

NET SYSTEM INFLOW = 1087.59
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 1087.59

==========
Time: 10.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 10.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 10.000

TIME FROM INITIATION OF EPS = 10.0000 HOURS (1000 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE HL/ VELO. (ft/s)	1000 (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	68.11	J-161	55.62
J-60	68.10	J-116	56.09
J-52	68.07	J-159	57.67
J-54	68.07	J-152	58.54
J-55	68.06	J-149	58.61
J-53	67.98	J-153	58.67
J-42	67.98	J-150	58.70
J-45	67.92	J-160	59.17
J-51	67.91	J-158	59.25
J-50	67.89	J-156	60.08

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	2.86	P-246	0.00
P-213	2.49	P-54	0.00
P-198	2.39	P-192	0.00
P-254	2.37	P-193	0.00
P-255	2.37	P-79	0.00
P-217	2.03	P-190	0.00

P-244	1.99	P-81	0.01
P-147	1.99	P-91	0.01
P-214	1.84	P-195	0.01
P-106	1.76	P-168	0.01

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	3.40	P-246	0.00
P-256	3.10	P-54	0.00
P-213	2.92	P-192	0.00
P-217	2.54	P-193	0.00
P-198	2.22	P-79	0.00
P-254	2.19	P-190	0.00
P-235	1.77	P-81	0.00
P-244	1.58	P-91	0.00
P-147	1.58	P-195	0.00
P-199	1.45	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	1740.15	

NET SYSTEM INFLOW = 1740.15
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 1740.15

==========
Time: 12.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 12.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 12.000

TIME FROM INITIATION OF EPS = 12.0000 HOURS (1200 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE HL/ VELO. (ft/s)	1000 (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	71.32	J-161	57.44
J-52	71.27	J-116	58.27
J-54	71.27	J-159	59.48
J-55	71.27	J-152	60.00
J-60	71.25	J-153	60.10
J-53	71.19	J-149	60.12
J-42	71.19	J-150	60.17
J-45	71.11	J-160	60.89
J-51	71.10	J-158	60.98
J-50	71.10	J-148	61.48

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	1.19	P-246	0.00
P-213	1.04	P-54	0.00
P-198	1.00	P-192	0.00
P-254	0.99	P-193	0.00
P-255	0.99	P-79	0.00
P-217	0.85	P-190	0.00
P-244	0.83	P-81	0.00
P-147	0.83	P-91	0.00
P-214	0.77	P-195	0.00
P-106	0.73	P-168	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	0.67	P-246	0.00
P-256	0.61	P-54	0.00
P-213	0.58	P-192	0.00
P-217	0.50	P-193	0.00
P-198	0.44	P-79	0.00
P-254	0.43	P-190	0.00
P-235	0.35	P-81	0.00
P-244	0.31	P-91	0.00
P-147	0.31	P-195	0.00
P-199	0.29	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	725.06	

NET SYSTEM INFLOW = 725.06
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 725.06

==========

Time: 14.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 14.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 14.000

TIME FROM INITIATION OF EPS = 14.0000 HOURS (1400 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE HL/ VELO. (ft/s)	1000 (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	71.89	J-161	57.77
J-52	71.84	J-116	58.66
J-54	71.84	J-159	59.81
J-55	71.84	J-152	60.26
J-60	71.81	J-153	60.35
J-53	71.76	J-149	60.39
J-42	71.76	J-150	60.44
J-45	71.67	J-160	61.20
J-51	71.67	J-158	61.29
J-50	71.67	J-148	61.71

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	0.60	P-246	0.00
P-213	0.52	P-54	0.00
P-198	0.50	P-192	0.00
P-254	0.49	P-193	0.00
P-255	0.49	P-79	0.00
P-217	0.42	P-190	0.00
P-244	0.41	P-81	0.00
P-147	0.41	P-91	0.00
P-214	0.38	P-195	0.00
P-106	0.37	P-168	0.00

H L / 1 0 0 0

PIPE	MAXIMUM	PIPE	MINIMUM

NUMBER	HL/1000 (ft/ft)	NUMBER	HL/1000 (ft/ft)
P-255	0.19	P-246	0.00
P-256	0.17	P-54	0.00
P-213	0.16	P-192	0.00
P-217	0.14	P-193	0.00
P-198	0.12	P-79	0.00
P-254	0.12	P-190	0.00
P-235	0.10	P-81	0.00
P-244	0.09	P-91	0.00
P-147	0.09	P-195	0.00
P-199	0.08	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	362.53	

NET SYSTEM INFLOW = 362.53
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 362.53

==========

Time: 16.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 16.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 16.000

TIME FROM INITIATION OF EPS = 16.0000 HOURS (1600 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	1000 HL/ (ft/ft)

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	70.91	J-161	57.21
J-52	70.87	J-116	57.99
J-54	70.87	J-159	59.25
J-55	70.87	J-152	59.82
J-60	70.85	J-153	59.92
J-53	70.78	J-149	59.93
J-42	70.78	J-150	59.99
J-45	70.70	J-160	60.67
J-51	70.70	J-158	60.76
J-50	70.70	J-148	61.32

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	1.49	P-246	0.00
P-213	1.30	P-54	0.00
P-198	1.25	P-192	0.00
P-254	1.24	P-193	0.00
P-255	1.24	P-79	0.00
P-217	1.06	P-190	0.00
P-244	1.04	P-81	0.00
P-147	1.04	P-91	0.00
P-214	0.96	P-195	0.00
P-106	0.92	P-168	0.00

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	1.01	P-246	0.00

P-256	0.93	P-54	0.00
P-213	0.87	P-192	0.00
P-217	0.76	P-193	0.00
P-198	0.66	P-79	0.00
P-254	0.65	P-190	0.00
P-235	0.53	P-81	0.00
P-244	0.47	P-91	0.00
P-147	0.47	P-195	0.00
P-199	0.43	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	906.33	

NET SYSTEM INFLOW = 906.33
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 906.33

==========
Time: 18.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 18.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 18.000

TIME FROM INITIATION OF EPS = 18.0000 HOURS (1800 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E NODE NUMBERS FLOWRATE HEAD MINOR LINE HL/

NAME	#1	#2		LOSS	LOSS	VELO.	1000
			(gpm)	(ft)	(ft/s)	(ft/ft)	

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	70.43	J-161	56.94
J-54	70.39	J-116	57.67
J-52	70.39	J-159	58.98
J-55	70.39	J-152	59.60
J-60	70.38	J-153	59.70
J-53	70.30	J-149	59.71
J-42	70.30	J-150	59.77
J-45	70.23	J-160	60.42
J-51	70.22	J-158	60.50
J-50	70.22	J-148	61.12

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	1.79	P-246	0.00
P-213	1.55	P-54	0.00
P-198	1.49	P-192	0.00
P-254	1.48	P-193	0.00
P-255	1.48	P-79	0.00
P-217	1.27	P-190	0.00
P-244	1.24	P-81	0.00
P-147	1.24	P-91	0.00
P-214	1.15	P-195	0.00
P-106	1.10	P-168	0.01

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	1.42	P-246	0.00
P-256	1.30	P-54	0.00
P-213	1.22	P-192	0.00
P-217	1.07	P-193	0.00
P-198	0.93	P-79	0.00

P-254	0.92	P-190	0.00
P-235	0.74	P-81	0.00
P-244	0.66	P-91	0.00
P-147	0.66	P-195	0.00
P-199	0.61	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	1087.59	

NET SYSTEM INFLOW = 1087.59
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 1087.59

==========

Time: 20.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 20.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 20.000

TIME FROM INITIATION OF EPS = 20.0000 HOURS (2000 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE HL/ VELO. (ft/s)	1000 (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	68.11	J-161	55.62
J-60	68.10	J-116	56.09
J-52	68.07	J-159	57.67
J-54	68.07	J-152	58.54
J-55	68.06	J-149	58.61
J-53	67.98	J-153	58.67
J-42	67.98	J-150	58.70
J-45	67.92	J-160	59.17
J-51	67.91	J-158	59.25
J-50	67.89	J-156	60.08

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	2.86	P-246	0.00
P-213	2.49	P-54	0.00
P-198	2.39	P-192	0.00
P-254	2.37	P-193	0.00
P-255	2.37	P-79	0.00
P-217	2.03	P-190	0.00
P-244	1.99	P-81	0.01
P-147	1.99	P-91	0.01
P-214	1.84	P-195	0.01
P-106	1.76	P-168	0.01

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	3.40	P-246	0.00
P-256	3.10	P-54	0.00
P-213	2.92	P-192	0.00
P-217	2.54	P-193	0.00
P-198	2.22	P-79	0.00
P-254	2.19	P-190	0.00
P-235	1.77	P-81	0.00
P-244	1.58	P-91	0.00
P-147	1.58	P-195	0.00

P-199 1.45 P-168 0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	1740.15	

NET SYSTEM INFLOW = 1740.15
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 1740.15

==========
Time: 22.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 22.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 22.000

TIME FROM INITIATION OF EPS = 22.0000 HOURS (2200 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE HL/ 1000	VELO. (ft/s)	(ft/ft)

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	71.64	J-161	57.63
J-52	71.60	J-116	58.49
J-54	71.60	J-159	59.67
J-55	71.60	J-152	60.15
J-60	71.57	J-153	60.24
J-53	71.51	J-149	60.28
J-42	71.51	J-150	60.32
J-45	71.43	J-160	61.07
J-51	71.43	J-158	61.15
J-50	71.43	J-148	61.61

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	0.90	P-246	0.00
P-213	0.78	P-54	0.00
P-198	0.75	P-192	0.00
P-254	0.74	P-193	0.00
P-255	0.74	P-79	0.00
P-217	0.63	P-190	0.00
P-244	0.62	P-81	0.00
P-147	0.62	P-91	0.00
P-214	0.57	P-195	0.00
P-106	0.55	P-168	0.00

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	0.39	P-246	0.00
P-256	0.36	P-54	0.00
P-213	0.34	P-192	0.00
P-217	0.30	P-193	0.00
P-198	0.26	P-79	0.00
P-254	0.25	P-190	0.00
P-235	0.21	P-81	0.00
P-244	0.18	P-91	0.00
P-147	0.18	P-195	0.00
P-199	0.17	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	543.80	

NET SYSTEM INFLOW = 543.80
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 543.80

==========
Time: 24.000

C H A N G E S F O R N E X T S I M U L A T I O N (time = 24.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 24.000

TIME FROM INITIATION OF EPS = 24.0000 HOURS (2400 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE HL/ VELO. 1000 (ft/s) (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-56	71.96	J-161	57.81
J-52	71.92	J-116	58.71
J-54	71.92	J-159	59.85
J-55	71.92	J-152	60.30
J-60	71.88	J-153	60.39
J-53	71.83	J-149	60.43
J-42	71.83	J-150	60.47
J-45	71.75	J-160	61.24
J-51	71.75	J-158	61.33
J-50	71.75	J-148	61.74

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-256	0.48	P-246	0.00
P-213	0.41	P-54	0.00
P-198	0.40	P-192	0.00
P-254	0.40	P-193	0.00
P-255	0.40	P-79	0.00
P-217	0.34	P-190	0.00
P-244	0.33	P-81	0.00
P-147	0.33	P-91	0.00
P-214	0.31	P-195	0.00
P-106	0.29	P-168	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-255	0.12	P-246	0.00
P-256	0.11	P-54	0.00
P-213	0.11	P-192	0.00
P-217	0.09	P-193	0.00
P-198	0.08	P-79	0.00
P-254	0.08	P-190	0.00
P-235	0.06	P-81	0.00
P-244	0.06	P-91	0.00
P-147	0.06	P-195	0.00
P-199	0.05	P-168	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	290.03	

NET SYSTEM INFLOW = 290.03
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 290.03

Max/Min Summary

Summary of Max/Min Node Values

Node	MnPres	MnHead	MnHGL	MnTime	MxPres	MxHead	MxHGL	MxTime	Elevation
J-1	66.15	152.65	1586.45	10.00	70.15	161.89	1595.69	0.00	1433.8
J-10	66.02	152.36	1586.46	10.00	70.02	161.59	1595.69	0.00	1434.1
J-100	65.06	150.14	1588.24	10.00	68.29	157.59	1595.69	0.00	1438.1
J-101	65.34	150.79	1588.19	10.00	68.59	158.29	1595.69	0.00	1437.4
J-102	66.12	152.59	1588.09	10.00	69.42	160.19	1595.69	0.00	1435.5
J-103	65.49	151.14	1588.14	10.00	68.77	158.69	1595.69	0.00	1437.0
J-104	65.46	151.06	1588.16	10.00	68.72	158.59	1595.69	0.00	1437.1
J-105	65.29	150.66	1588.16	10.00	68.55	158.19	1595.69	0.00	1437.5
J-106	67.16	154.98	1588.08	10.00	70.46	162.59	1595.69	0.00	1433.1
J-107	67.12	154.89	1588.09	10.00	70.41	162.49	1595.69	0.00	1433.2
J-108	66.16	152.68	1588.08	10.00	69.46	160.29	1595.69	0.00	1435.4
J-109	66.12	152.58	1588.08	10.00	69.42	160.19	1595.69	0.00	1435.5
J-11	67.15	154.96	1586.46	10.00	71.15	164.19	1595.69	0.00	1431.5
J-112	66.16	152.68	1588.08	10.00	69.46	160.29	1595.69	0.00	1435.4
J-113	65.86	151.98	1588.08	10.00	69.16	159.59	1595.69	0.00	1436.1
J-114	65.93	152.16	1588.06	10.00	69.24	159.79	1595.69	0.00	1435.9

J-115	65.99	152.30	1588.20	10.00	69.24	159.79	1595.69
0.001435.9							
J-116	56.09	129.45	1589.45	10.00	58.80	135.70	1595.70
0.001460.0							
J-117	64.82	149.58	1588.38	10.00	67.99	156.89	1595.69
0.001438.8							
J-118	64.78	149.48	1588.28	10.00	67.99	156.89	1595.69
0.001438.8							
J-12	66.15	152.66	1586.46	10.00	70.15	161.89	1595.69
0.001433.8							
J-120	65.08	150.18	1588.18	10.00	68.33	157.69	1595.69
0.001438.0							
J-121	65.10	150.22	1588.12	10.00	68.38	157.79	1595.69
0.001437.9							
J-122	66.08	152.50	1588.10	10.00	69.37	160.09	1595.69
0.001435.6							
J-123	64.92	149.81	1588.11	10.00	68.20	157.39	1595.69
0.001438.3							
J-124	65.00	150.00	1588.10	10.00	68.29	157.59	1595.69
0.001438.1							
J-125	65.04	150.09	1588.09	10.00	68.33	157.69	1595.69
0.001438.0							
J-126	64.95	149.89	1588.09	10.00	68.25	157.49	1595.69
0.001438.2							
J-127	65.00	149.99	1588.09	10.00	68.29	157.59	1595.69
0.001438.1							
J-128	64.99	149.99	1588.09	10.00	68.29	157.59	1595.69
0.001438.1							
J-129	64.91	149.79	1588.09	10.00	68.20	157.39	1595.69
0.001438.3							
J-13	67.15	154.97	1586.47	10.00	71.15	164.19	1595.69
0.001431.5							
J-130	64.81	149.56	1590.26	10.00	67.16	155.00	1595.70
0.001440.7							
J-131	65.32	150.75	1590.95	10.00	67.38	155.50	1595.70
0.001440.2							
J-132	65.51	151.18	1591.28	10.00	67.43	155.60	1595.70
0.001440.1							
J-133	65.10	150.24	1590.84	10.00	67.21	155.10	1595.70
0.001440.6							
J-134	64.75	149.43	1590.33	10.00	67.08	154.80	1595.70
0.001440.9							
J-135	65.17	150.39	1590.69	10.00	67.34	155.40	1595.70
0.001440.3							
J-136	64.63	149.15	1590.35	10.00	66.95	154.50	1595.70
0.001441.2							
J-137	65.03	150.07	1590.47	10.00	67.29	155.30	1595.70
0.001440.4							
J-138	64.67	149.23	1590.33	10.00	66.99	154.60	1595.70
0.001441.1							
J-139	64.63	149.14	1590.34	10.00	66.95	154.50	1595.70
0.001441.2							
J-14	67.24	155.17	1586.47	10.00	71.24	164.39	1595.69
0.001431.3							
J-140	64.28	148.33	1593.53	10.00	65.22	150.50	1595.70
0.001445.2							

J-141	63.90	147.47	1592.87	10.00	65.13	150.30	1595.70
0.001445.4							
J-142	60.64	139.95	1591.95	10.00	62.27	143.70	1595.70
0.001452.0							
J-143	64.34	148.48	1594.08	10.00	65.04	150.10	1595.70
0.001445.6							
J-144	62.22	143.59	1593.19	10.00	63.31	146.10	1595.70
0.001449.6							
J-145	60.40	139.39	1591.99	10.00	62.01	143.10	1595.70
0.001452.6							
J-146	60.40	139.38	1591.98	10.00	62.01	143.10	1595.70
0.001452.6							
J-147	61.96	142.98	1592.48	10.00	63.35	146.20	1595.70
0.001449.5							
J-148	60.20	138.91	1592.01	10.00	61.79	142.60	1595.70
0.001453.1							
J-149	58.61	135.26	1591.36	10.00	60.49	139.60	1595.70
0.001456.1							
J-15	67.24	155.18	1586.48	10.00	71.24	164.39	1595.69
0.001431.3							
J-150	58.70	135.46	1591.46	10.00	60.54	139.70	1595.70
0.001456.0							
J-151	60.20	138.92	1591.82	10.00	61.88	142.80	1595.70
0.001452.9							
J-152	58.54	135.08	1591.48	10.00	60.36	139.30	1595.70
0.001456.4							
J-153	58.67	135.39	1591.59	10.00	60.45	139.50	1595.70
0.001456.2							
J-154	60.27	139.08	1591.68	10.00	62.01	143.10	1595.70
0.001452.6							
J-155	60.63	139.91	1591.31	10.00	62.53	144.30	1595.70
0.001451.4							
J-156	60.08	138.64	1590.84	10.00	62.18	143.50	1595.70
0.001452.2							
J-157	60.38	139.34	1590.84	10.00	62.49	144.20	1595.70
0.001451.5							
J-158	59.25	136.73	1590.73	10.00	61.40	141.70	1595.70
0.001454.0							
J-159	57.67	133.08	1590.48	10.00	59.93	138.30	1595.70
0.001457.4							
J-16	67.16	154.98	1586.48	10.00	71.15	164.19	1595.69
0.001431.5							
J-160	59.17	136.54	1590.74	10.00	61.31	141.50	1595.70
0.001454.2							
J-161	55.62	128.35	1590.45	10.00	57.89	133.60	1595.70
0.001462.1							
J-162	66.24	152.86	1586.86	10.00	70.07	161.69	1595.69
0.001434.0							
J-163	66.33	153.06	1586.86	10.00	70.15	161.89	1595.69
0.001433.8							
J-164	64.89	149.75	1586.65	10.00	68.81	158.79	1595.69
0.001436.9							
J-166	65.68	151.56	1586.36	10.00	69.72	160.89	1595.69
0.001434.8							
J-168	65.63	151.46	1592.86	10.00	66.86	154.30	1595.70
0.001441.4							

J-17	66.08	152.50	1586.50	10.00	70.07	161.69	1595.69
0.001434.0							
J-170	64.85	149.65	1595.05	10.00	65.13	150.30	1595.70
0.001445.4							
J-18	66.14	152.64	1586.54	10.00	70.11	161.79	1595.69
0.001433.9							
J-19	66.19	152.75	1586.45	10.00	70.20	161.99	1595.69
0.001433.7							
J-2	65.35	150.82	1587.92	10.00	68.72	158.59	1595.69
0.001437.1							
J-20	62.66	144.60	1586.40	10.00	66.69	153.89	1595.69
0.001441.8							
J-21	64.92	149.81	1586.41	10.00	68.94	159.09	1595.69
0.001436.6							
J-22	62.53	144.30	1586.40	10.00	66.56	153.59	1595.69
0.001442.1							
J-23	62.70	144.70	1586.40	10.00	66.73	153.99	1595.69
0.001441.7							
J-24	62.75	144.81	1586.41	10.00	66.77	154.09	1595.69
0.001441.6							
J-25	67.02	154.65	1586.45	10.00	71.02	163.89	1595.69
0.001431.8							
J-26	65.68	151.56	1586.36	10.00	69.72	160.89	1595.69
0.001434.8							
J-27	67.20	155.07	1586.47	10.00	71.19	164.29	1595.69
0.001431.4							
J-28	66.19	152.75	1586.45	10.00	70.20	161.99	1595.69
0.001433.7							
J-29	66.67	153.86	1586.86	10.00	70.50	162.69	1595.69
0.001433.0							
J-3	66.03	152.37	1586.47	10.00	70.02	161.59	1595.69
0.001434.1							
J-30	65.60	151.38	1587.08	10.00	69.33	159.99	1595.69
0.001435.7							
J-31	67.08	154.79	1586.39	10.00	71.11	164.09	1595.69
0.001431.6							
J-32	65.72	151.67	1586.37	10.00	69.76	160.99	1595.69
0.001434.7							
J-33	65.68	151.56	1586.36	10.00	69.72	160.89	1595.69
0.001434.8							
J-34	66.59	153.68	1586.38	10.00	70.63	162.99	1595.69
0.001432.7							
J-35	67.04	154.71	1586.41	10.00	71.06	163.99	1595.69
0.001431.7							
J-36	66.99	154.59	1586.39	10.00	71.02	163.89	1595.69
0.001431.8							
J-37	67.15	154.96	1586.46	10.00	71.15	164.19	1595.69
0.001431.5							
J-38	67.72	156.27	1586.47	10.00	71.71	165.49	1595.69
0.001430.2							
J-39	67.11	154.86	1586.46	10.00	71.11	164.09	1595.69
0.001431.6							
J-4	63.80	147.23	1586.43	10.00	67.81	156.49	1595.69
0.001439.2							
J-40	67.19	155.07	1586.47	10.00	71.19	164.29	1595.69
0.001431.4							

J-41	67.80	156.47	1586.47	10.00	71.80	165.69	1595.69	0.001430.0
J-42	67.98	156.87	1586.47	10.00	71.97	166.09	1595.69	0.001429.6
J-43	67.80	156.47	1586.47	10.00	71.80	165.69	1595.69	0.001430.0
J-44	67.80	156.47	1586.47	10.00	71.80	165.69	1595.69	0.001430.0
J-45	67.92	156.74	1586.54	10.00	71.89	165.89	1595.69	0.001429.8
J-46	67.85	156.58	1586.48	10.00	71.84	165.79	1595.69	0.001429.9
J-47	67.18	155.02	1586.52	10.00	71.15	164.19	1595.69	0.001431.5
J-48	67.34	155.41	1586.51	10.00	71.32	164.59	1595.69	0.001431.1
J-49	67.86	156.61	1586.51	10.00	71.84	165.79	1595.69	0.001429.9
J-5	63.84	147.31	1586.41	10.00	67.86	156.59	1595.69	0.001439.1
J-50	67.89	156.68	1586.48	10.00	71.89	165.89	1595.69	0.001429.8
J-51	67.91	156.71	1586.51	10.00	71.89	165.89	1595.69	0.001429.8
J-52	68.07	157.07	1586.47	10.00	72.06	166.29	1595.69	0.001429.4
J-53	67.98	156.88	1586.47	10.00	71.97	166.09	1595.69	0.001429.6
J-54	68.07	157.07	1586.47	10.00	72.06	166.29	1595.69	0.001429.4
J-55	68.06	157.07	1586.47	10.00	72.06	166.29	1595.69	0.001429.4
J-56	68.11	157.17	1586.47	10.00	72.10	166.39	1595.69	0.001429.3
J-57	67.20	155.08	1586.48	10.00	71.19	164.29	1595.69	0.001431.4
J-58	67.29	155.29	1586.49	10.00	71.28	164.49	1595.69	0.001431.2
J-59	66.99	154.58	1586.68	10.00	70.89	163.59	1595.69	0.001432.1
J-6	63.96	147.61	1586.41	10.00	67.99	156.89	1595.69	0.001438.8
J-60	68.10	157.16	1586.66	10.00	72.02	166.19	1595.69	0.001429.5
J-61	67.63	156.07	1586.67	10.00	71.54	165.09	1595.69	0.001430.6
J-62	66.47	153.40	1586.90	10.00	70.28	162.19	1595.69	0.001433.5
J-63	67.67	156.16	1586.66	10.00	71.58	165.19	1595.69	0.001430.5
J-64	67.63	156.07	1586.67	10.00	71.54	165.09	1595.69	0.001430.6
J-65	67.59	155.99	1586.69	10.00	71.50	164.99	1595.69	0.001430.7
J-66	67.64	156.09	1586.69	10.00	71.54	165.09	1595.69	0.001430.6

J-67	67.65	156.11	1586.71	10.00	71.54	165.09	1595.69
0.001430.6							
J-68	67.59	155.97	1586.67	10.00	71.50	164.99	1595.69
0.001430.7							
J-69	67.29	155.27	1586.67	10.00	71.19	164.29	1595.69
0.001431.4							
J-7	63.79	147.21	1586.41	10.00	67.81	156.49	1595.69
0.001439.2							
J-70	67.42	155.58	1586.68	10.00	71.32	164.59	1595.69
0.001431.1							
J-71	67.59	155.97	1586.67	10.00	71.50	164.99	1595.69
0.001430.7							
J-72	66.45	153.36	1586.86	10.00	70.28	162.19	1595.69
0.001433.5							
J-73	65.19	150.44	1587.24	10.00	68.85	158.89	1595.69
0.001436.8							
J-74	65.08	150.20	1587.10	10.00	68.81	158.79	1595.69
0.001436.9							
J-75	66.40	153.24	1586.94	10.00	70.20	161.99	1595.69
0.001433.7							
J-76	66.34	153.10	1586.90	10.00	70.15	161.89	1595.69
0.001433.8							
J-77	65.04	150.10	1586.90	10.00	68.85	158.89	1595.69
0.001436.8							
J-78	64.98	149.96	1586.96	10.00	68.77	158.69	1595.69
0.001437.0							
J-79	66.15	152.66	1586.86	10.00	69.98	161.49	1595.69
0.001434.2							
J-8	62.66	144.61	1586.41	10.00	66.69	153.89	1595.69
0.001441.8							
J-80	65.89	152.06	1586.86	10.00	69.72	160.89	1595.69
0.001434.8							
J-81	64.95	149.88	1586.88	10.00	68.77	158.69	1595.69
0.001437.0							
J-82	65.94	152.16	1586.86	10.00	69.76	160.99	1595.69
0.001434.7							
J-83	66.66	153.84	1586.94	10.00	70.46	162.59	1595.69
0.001433.1							
J-84	67.18	155.04	1586.84	10.00	71.02	163.89	1595.69
0.001431.8							
J-85	67.04	154.71	1586.81	10.00	70.89	163.59	1595.69
0.001432.1							
J-86	66.79	154.12	1586.82	10.00	70.63	162.99	1595.69
0.001432.7							
J-87	66.71	153.95	1586.85	10.00	70.54	162.79	1595.69
0.001432.9							
J-88	66.72	153.97	1586.97	10.00	70.50	162.69	1595.69
0.001433.0							
J-89	65.47	151.09	1586.99	10.00	69.24	159.79	1595.69
0.001435.9							
J-9	67.15	154.96	1586.46	10.00	71.15	164.19	1595.69
0.001431.5							
J-90	65.51	151.17	1588.37	10.00	68.68	158.49	1595.69
0.001437.2							
J-91	64.86	149.67	1588.37	10.00	68.03	156.99	1595.69
0.001438.7							

J-92	64.64	149.17	1588.37	10.00	67.81	156.49	1595.69
0.001439.2							
J-93	64.86	149.67	1588.37	10.00	68.03	156.99	1595.69
0.001438.7							
J-94	64.47	148.78	1588.38	10.00	67.64	156.09	1595.69
0.001439.6							
J-95	64.59	149.04	1588.44	10.00	67.73	156.29	1595.69
0.001439.4							
J-96	63.82	147.29	1588.49	10.00	66.95	154.49	1595.69
0.001441.2							
J-97	63.84	147.31	1588.51	10.00	66.95	154.49	1595.69
0.001441.2							
J-98	63.91	147.48	1588.48	10.00	67.03	154.69	1595.69
0.001441.0							
J-99	64.89	149.75	1588.65	10.00	67.94	156.79	1595.69
0.001438.9							
R-1	65.00	150.00	1595.70	0.00	65.00	150.00	1595.70
0.001445.7							

***** HYDRAULIC ANALYSIS COMPLETED *****

RESULTS FOR J-1 DURING FIRE FLOW

AT PEAK HOUR (20 hours or 8:00pm)

C H A N G E S F O R N E X T S I M U L A T I O N (time = 20.0000 hours)

UNIT COST OF POWER FOR THIS SIMULATION PERIOD = 0.050 $/kW-Hr

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Time: 20.000

TIME FROM INITIATION OF EPS = 20.0000 HOURS (2000 HOURS, DAY: 1)

RESULTS OBTAINED AFTER 5 TRIALS: ACCURACY = 0.00001

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE	HEAD LOSS	MINOR LOSS	LINE VELO.	HL/ 1000

(gpm) (ft) (ft)
(ft/s) (ft/ft)

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
R-1	65.00	J-22	23.90
J-170	63.34	J-20	24.03
J-143	60.64	J-23	24.12
J-140	59.21	J-1	24.20
J-168	58.90	J-8	24.31
J-141	57.18	J-24	24.34
J-144	56.39	J-7	25.44
J-132	54.91	J-5	25.59
J-147	54.33	J-4	25.63
J-131	54.14	J-6	25.72

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-40	9.13	P-91	0.01
P-256	7.77	P-168	0.01
P-106	7.38	P-92	0.01
P-213	6.98	P-178	0.01
P-244	6.77	P-65	0.01
P-198	6.65	P-79	0.01
P-254	6.50	P-80	0.02
P-255	6.37	P-76	0.02
P-66	6.32	P-81	0.02
P-147	6.24	P-194	0.04

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-40	26.52	P-91	0.00
P-255	21.19	P-178	0.00
P-213	19.75	P-65	0.00
P-256	19.67	P-168	0.00
P-106	17.87	P-92	0.00
P-217	17.35	P-79	0.00
P-244	15.23	P-80	0.00

P-198	14.74	P-76	0.00
P-254	14.13	P-81	0.00
P-235	13.62	P-194	0.00

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	4740.75	

NET SYSTEM INFLOW = 4740.75
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4740.75

Appendix B

Community Water Systems Source Book
Tables and Figures

CHAPTER I

Basic Design Criteria

General

Water has become an important consideration in the modern way of living. The usage of water per person has more than tripled within the time period of 1945 to 1959. With the increased use of modern appliances, water is becoming the prime factor in the development of new communities. This modern way of living is based upon the desire for cleanliness and unlimited quantities of high quality water. The problem of meeting this demand of unlimited quantities of high qaulity water is facing each municipality, water company, developer, and individual concerned with public, semi-public, or private water supply. This problem is complicated by the lack of desired developmental property, the complexity of living conditions and the problem of environmental health of the community.

In the study of water usage or consumption within any community, one will discover that the variations in daily, weekly, and monthly usage are unique to that community and will differ somewhat from community to community. The standards of living within the different communities will account for much of the variations in per capita water consumption. As the increment of water usage becomes smaller, such as from daily to hourly, the fluctuations from community to community become greater. If one were to make a graph of water usage comparing a small community with a large community, the graph would be as illustrated in Figure 1. It can be

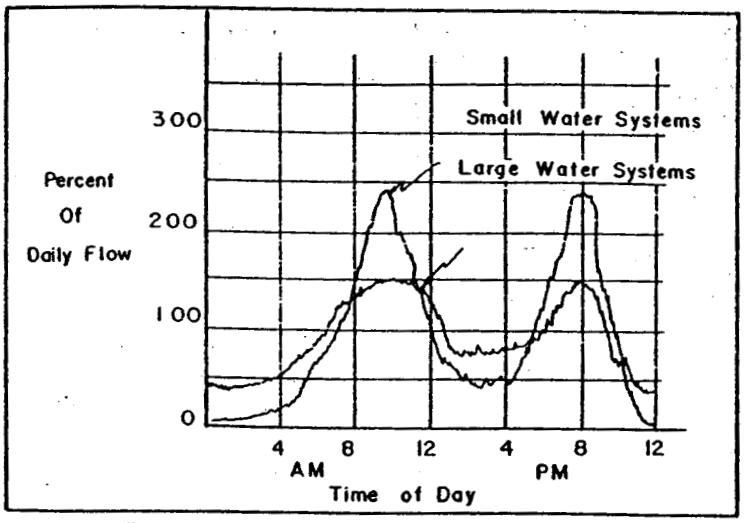
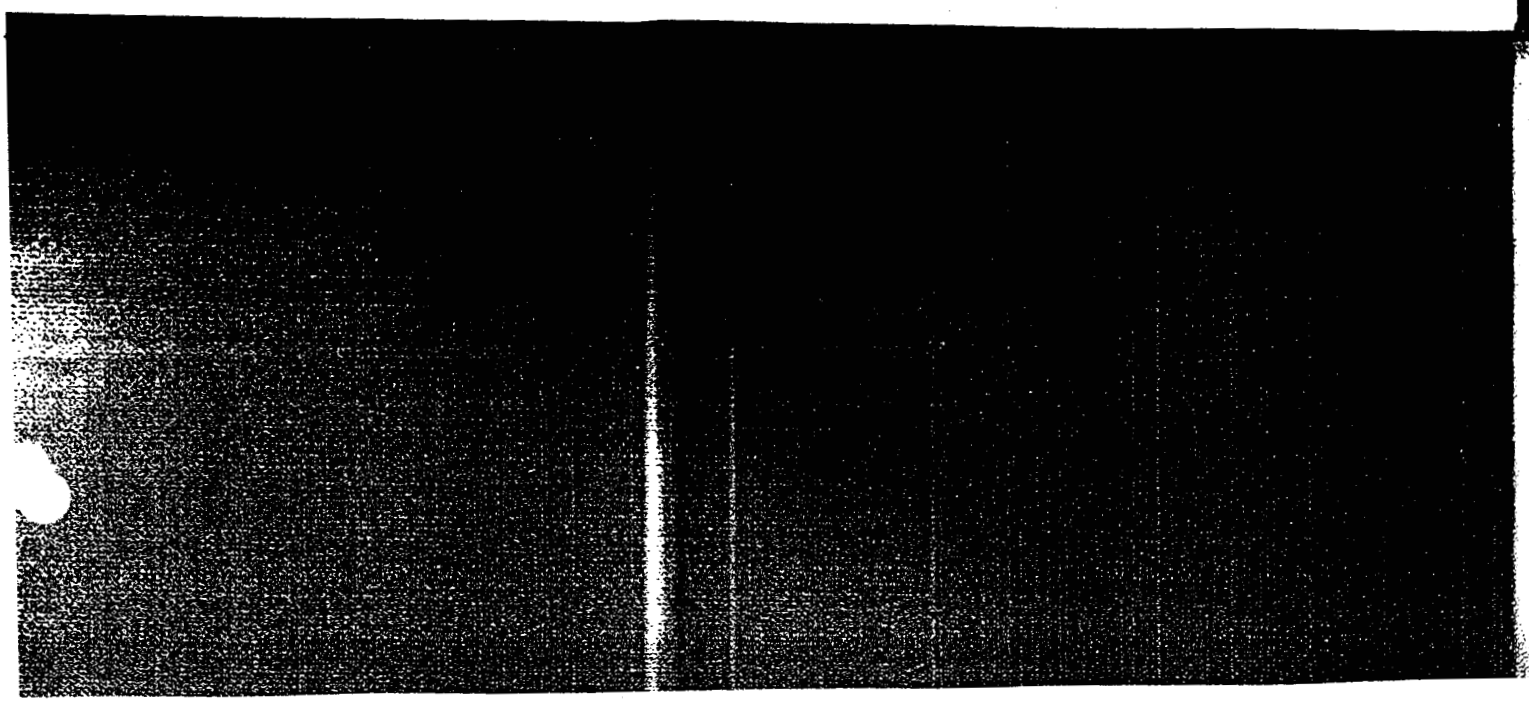


FIGURE 1. Hourly Variations In Water Flow.



pulation growth is achieved by cal-ating the growth increment per ir for a period of ten years (Census ars), then projecting to the future ir desired by multiplying the y crement by the number of ir ce.

4. phical representation of 100 enrollment growth applied as trend to illustrate community wth.

5. Compilations of predictions of er agencies interested in commun-growth such as Chamber of Com-rce, Gas and Telephone Utilities, al Statistics Section of the State alth Department, etc.

should be remembered that mass pulation movements in and out of mmunities caused by influx or re-ation of large industries will not reflected in such studies of future pulations but will be reflected in t population trends.

Upon obtaining a predicted popu-on, the future urban area develop-nt of the community or extension the community limits may be ob-ed by dividing the yearly esti-mated population by the present area of the community until a population density of some 4,300 persons per square mile is obtained. At that time, the area of the community should be increased so that the density of the population will be decreased to around 2,400 persons per square mile. This procedure is again repeated until the maximum of 4,300 is again reached. For communities over 100,-000, the density of population will vary as previously discussed.

In many new developments it is desirable to have an estimate of the number of residences which may be constructed prior to the actual sub-dividing of the property. From a knowledge of proposed lot size and acreage of the tract, Table I(a) supplements Table I so that the approxi-mate number of residences may be roughly established. Table I(a) takes into consideration that a street right-of-way of 60 feet is to be provided for and that a certain percentage of the lots will not be suitable for con-struction because of topography.

TABLE I(a)

imated Number of Dwellings Per Area from Average Lot Size

Average Lot Area in Square Feet	Estimated Number of Dwellings Per Acre	Estimated Number of Dwellings Per Square Mile
0,000	1.56	1,040
5,000	1.05	672
0,000	.78	504
25,000	.63	403
30,000	.52	336
40,000	.32	204
50,000	.29	186
60,000	.26	167
70,000	.22	144
80,000	.19	121

TABLE II

Estimating Domestic Populations

Type of Dwelling	Estimated Persons Per Dwelling
First-Class	4
Multi-Dwelling	
One Bedroom Unit	2
Two Bedroom Unit	3
Three Bedroom Unit	5
Mobile Home	2½

Table II provides estimates of populations for various types of residential housing facilities. These figures are based upon average values obtained from community study for various types of dwellings.

In determining domestic water usage, the daily usage must be based upon the maximum day of the week so that this quantity of water will be available for the community at all times. This maximum quantity of water necessary to furnish the need of the community will depend upon whether or not the system is metered. A system which is not metered will have a demand for water as great as 300 per cent of that community which is metered. For design purposes, the following values are accepted in general practice for water consumption for domestic populations:

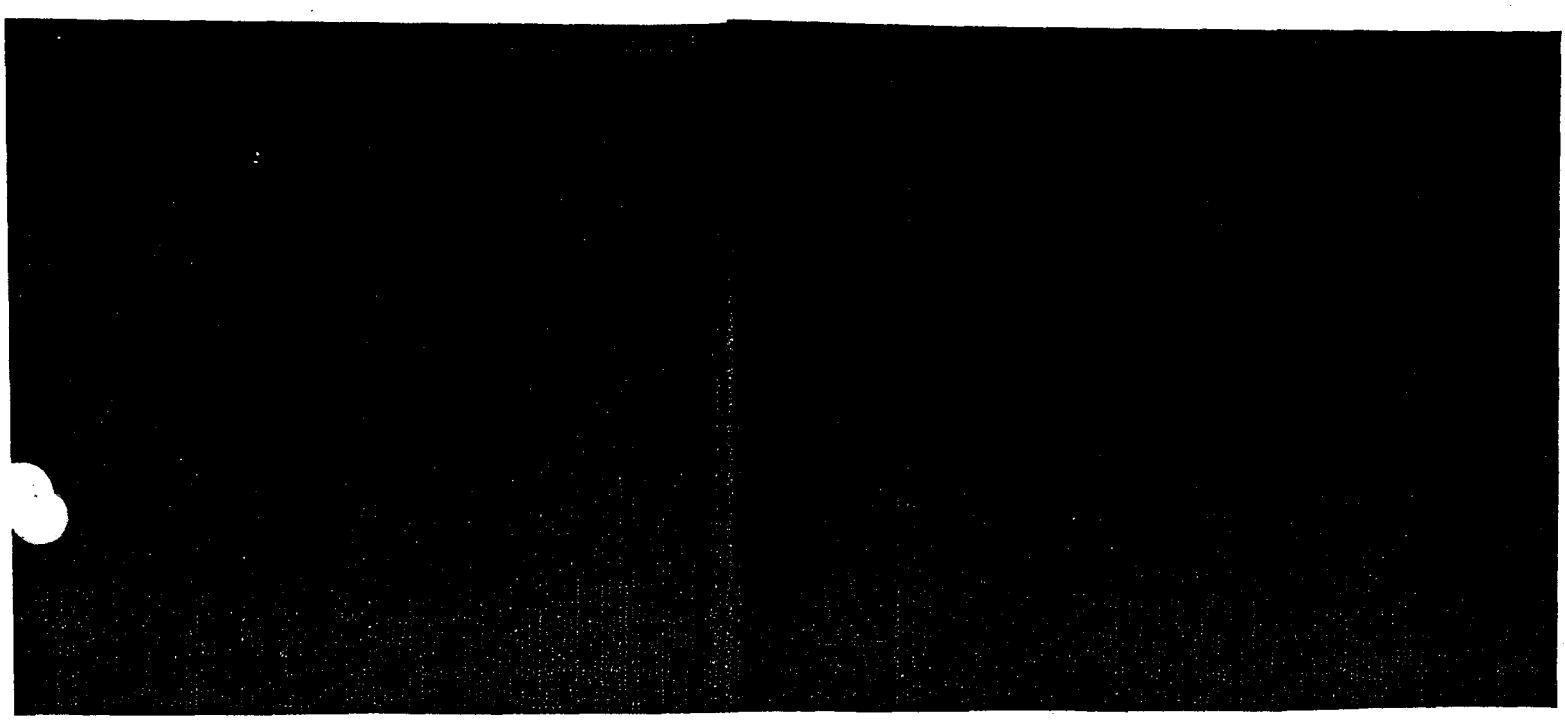
On the basis of these accepted values, first class dwellings will have a daily usage of 500 gallons based upon the maximum day of the week for the system which is 100% metered. If the system is unmetered, the daily usage is expected to be around 1,000 gallons per day. The primary reason for this great difference in usage between the metered and unmetered systems is that a person on an unmetered system will use water freely and will not maintain his plumbing fixtures in good repair to prevent leakage. Also there will be a great deal more lawn watering on the system which has no meters. A further example of the use of Table II and Table III would be that the expected water usage of a multi-dwelling building with three two-bedroom units would be on the basis of nine persons

TABLE III

Domestic Water Consumption*

Type of System	Daily Consumption Per Person
All Metered Services	70-100-125 Gallons
Unmetered Services	100-150-250 Gallons

*The commonly accepted value for water usage for domestic populations is 100 gallons per day per person. Studies indicate that the combined average water usage for a community will vary from 69 to 109 gallons per person per day. Hence, for design of a community water system, the value of 125 gallons per day is the suggested value since it is a maximum per day usage per person.



ch a usage of 1,125 gallons per
on a metered system or 2,250 gal-
as per day on an unmetered system.

nstitutional Water Requirements

W requirements for institutions
y ve determined on the pop-
iti asis as above. Such water
su on figures should be based
on the *future* enrollment of the
ool or institution, and upon future
ns concerning changes in status of
type of the institution. Table IV
gests criteria on the per student
person basis and relates the type
institution to be served with this
person water usage.

it is impossible to predict with any degree of accuracy the potential success of the establishment. Therefore, Table V not only sets forth criteria for water consumption, but also is a simplified basis for the calculation of such requirements.

Upon the basis of water usage as given in Table V, the total daily water consumption can be calculated.

The total water requirements for a community would be the total as calculated, combining information from Tables II through V. To illustrate the use of these tables, an example would be, that a community, for which a water system is to be designed has 60 first-class dwellings, a 200-student elementary school, a drug store with fountain service, a ready-to-wear shop, and a small super market, which has 5,000 square feet of floor area. From this information, it would be expected that this community would have a daily water usage or consumption as follows:

60 first-class dwellings with four persons per dwelling (Table II) will have a water usage of 125 gallons per day per person (Table III) = 30,000 gpd.

200-student elementary school with a water usage of 16 gallons per day per student (Table IV) = 3,200 gpd.

One drug store with fountain service will have a daily water usage of 500 gpd plus 1,200 gpd (Table V) = 1,700 gpd.

One ready-to-wear shop will have a daily water usage of 500 gpd (other establishments—Table V) = 500 gpd.

One super market will have a daily usage based upon five gallons per 100 square feet of floor area (Table V), a usage of five gallons/100 square feet times 5,000 square feet = 250 gallons per day or from footnote for Table V, a usage of 500 gallons per day. Therefore, usage = 500 gpd.

A total requirement for water for this community is estimated to be 35,900 gallons per day. This will be the quantity of water required to meet

TABLE IV
Institutional Water Consumption

Type of Institution	Gallons Per Person Per Day
Boarding Schools, Elementary	75
Boarding Schools, Senior	100
Churches	3
Clubs, Country	25
Clubs, Civic	3
College, Day Students	25
College, Junior	100
College, Senior	100
Elementary Schools	16
Hospitals	400
Junior and High Schools	25
Nursing Homes	150
Prisons	60
Rooming Houses	100
Camps	60

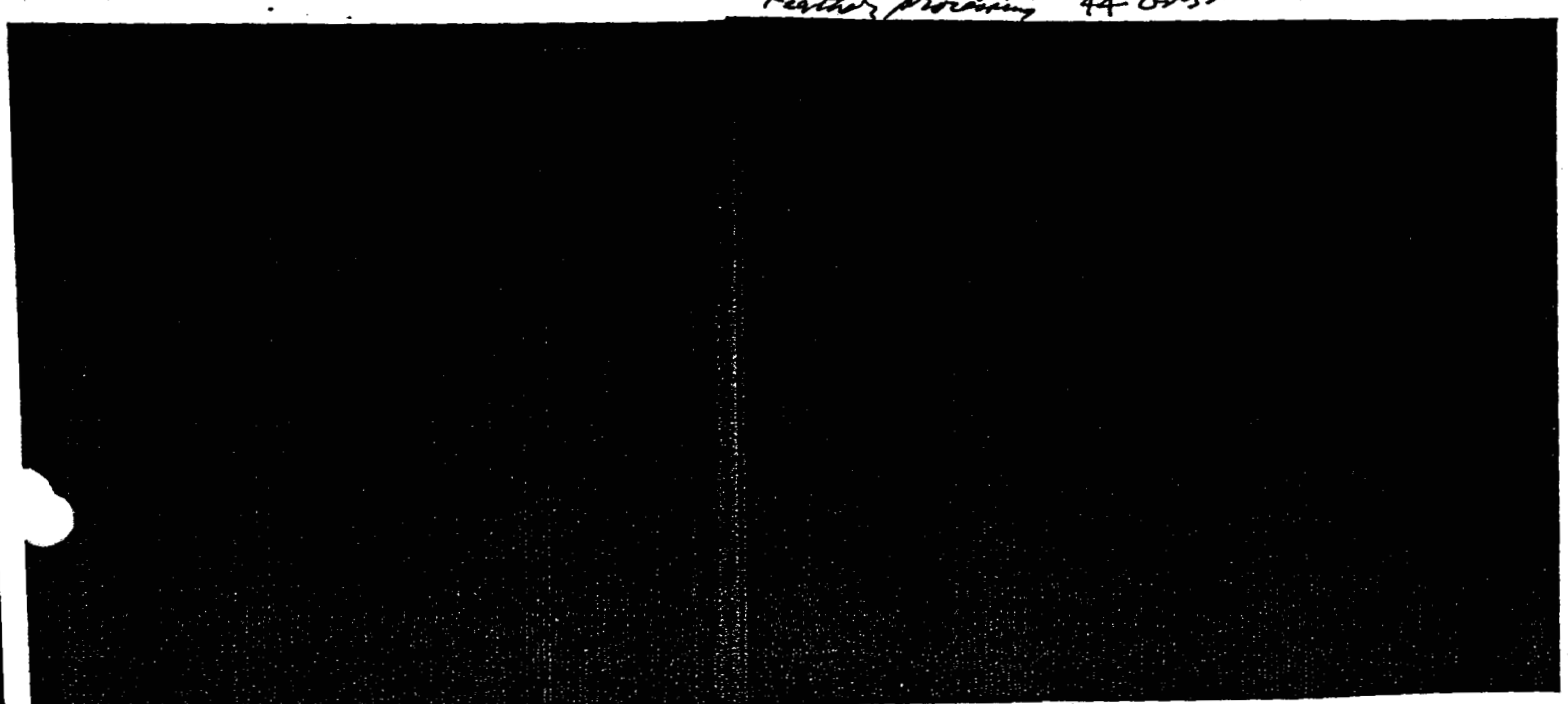
mmercial and Industrial Water
lequirements

mmercial and industrial water must be calculated on some basis rather than either the pa-
ge or per person usage because

TABLE V
Commercial and Industrial Water Consumption Requirements

Type of Establishment	Estimated Water Usage and Basis of Calculation
Barber Shop	100 gallons per day per chair
Beauty Shop	125 gallons per day per chair
Dentist Office	750 gallons per day per chair
Department Store*	40 gallons per day per employee
Drug Store	500 gallons per day
With Fountain Service	Add 1,200 to 1,500 gallons per day
Serving Meals	Add 50 gallons per day per seat
Industrial Plant**	30 gallons per day per employee
Laundry	2,000-5,000-20,000 gallons per day
Launderette	1,000 gallons per day per unit
Meat Market	5 gallons per day per 100 sq. ft. floor area
Motel or Hotel	125 gallons per day per room
Office Building*	12 gallons per day per 100 sq. ft. floor area or 25 gallons per employee
Physicians Office	200 gallons per day per examining room
Restaurant	20-50-120 gallons per day per seat
Single Service	500-1,500-2,500 gallons per day
Drive-In	20 gallons per day per car space
Service Station	600-1,000-1,500 gallons per day per wash rack
Theatre	3 gallons per day per seat
Drive-In	3 gallons per day per car space
Other Establishments***	500 gallons per day

*Including customer service.
**Not including process water.
***Non-water using establishments. 500 gallons per day should be considered the minimum daily usage for any establishment.



umbing fixtures located within ommunity will be in operation same time. This fact is recog- by plumbing codes and man- This instantaneous water de- w se a greater flow within ys r that particular time. e aunity increases in size, st. eous water requirement crease accordingly because of dividualism of consumers which o average out the percentage of s operating at the same instant, y causing a decrease in the sharp ations of instantaneous usage.

rage Requirements

rage requirements are based average daily consumption and naximum instantaneous flows the community. The occur- of instantaneous flows so greatly s the average flows and require- of the community that it is ary to calculate these maximum antaneous flows within a com- water system in order that and pumping facilities may be ly designed. Tables XIV, XV, VI provide information and which these calculations may be made. These tables set forth criteria for instantaneous flow demands for residential, commercial, and institutional areas.

The flow demand of institutions must be considered in the light of the time for which the institution is used per day. For example, day schools are operated for a period of six to eight hours per day, while other institutions such as colleges and hospitals are operated for 24 hours. The flow demand with this consideration is given in Table XVI.

Apartment buildings are to be considered as individual residential units within Table XIV and each apartment unit is thereby counted as a separate residence.

By considering the breakdown of the individual type of users in accordance with the above tables, it is possible to determine the individual instantaneous flows and the total instantaneous flows required for a water system. This total instantaneous flow is the demand upon storage facilities which may be expected to occur instantaneously during a 24-hour period. The total average daily demand for water may be obtained from Table II, III, IV, and V.

An example of determining total flow which would occur instantaneously within a community would be in the case of a water system which is to serve a community of 80 residences and a commercial center comprised of a ready-to-wear shop, a drug store which has fountain service, a television repair shop, and a super market of 3,000 square feet floor area. The breakdown of individual flows and the total instantaneous flow for this community, would be as follows:

80 Residences at 2.2 gpm per residence (Table XIV)	176 gpm
1 Ready-to-wear shop at 1.0 gpm (Table XV)	1 gpm
1 Drug Store (3.0 gpm) with fountain service (3.0 gpm) (Table XV)	6 gpm
1 Television repair shop at 1.0 gpm (Table XV)	1 gpm
1 Super Market at 1.0 gpm/100 square feet x 3,000 square feet	30 gpm
Total Instantaneous Flow	214 gpm

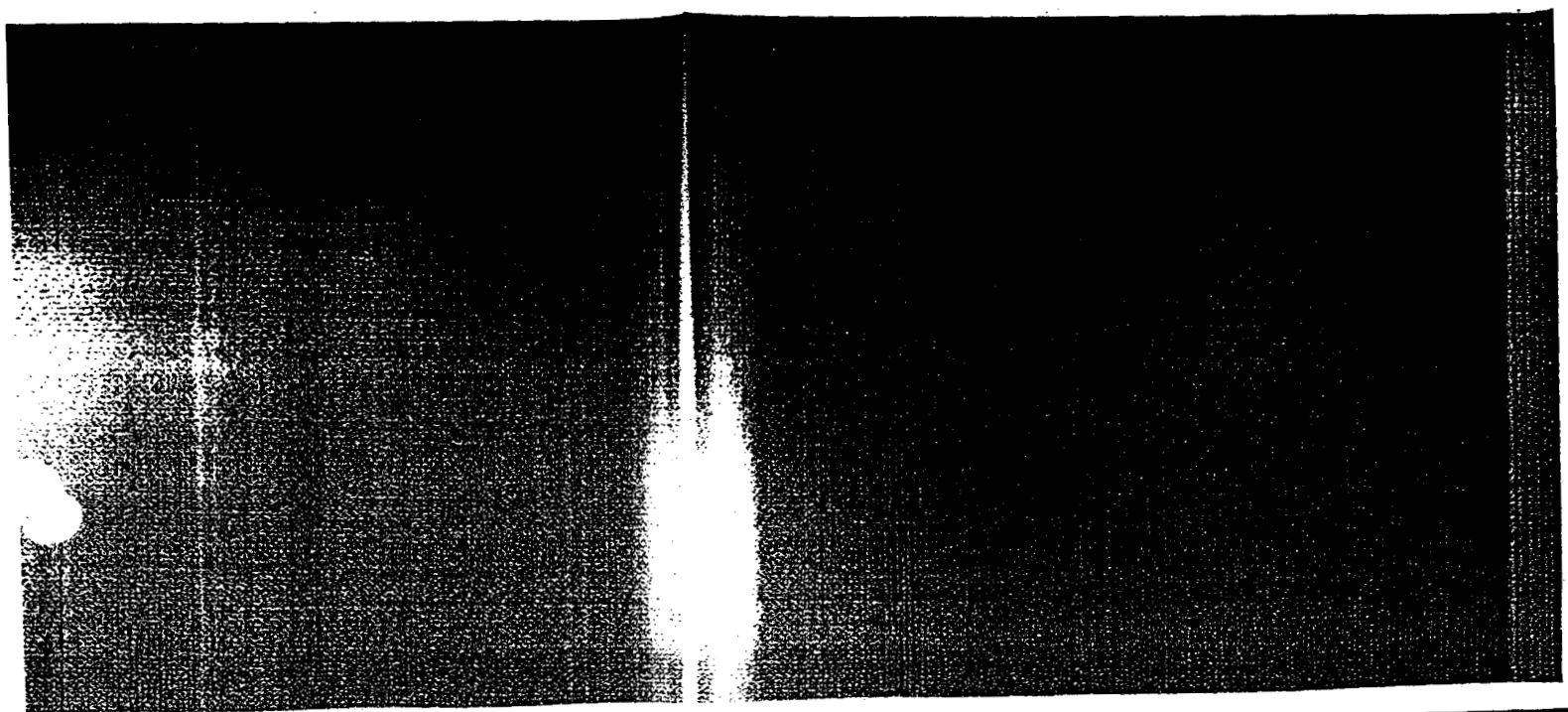
TABLE XIV
Instantaneous Water Demands for Residential Areas

l Number esidences ed	GPM Per Residence	Total Number of Residence Served	GPM Per Residence
	8.0	90	2.1
	5.0	100	2.0
20	4.3	150	1.6
30	3.8	200	1.3
40	3.4	300	1.2
50	3.0	400	0.9
60	2.7	500	0.8
70	2.5	750	0.7
80	2.2	1,000	0.6

TABLE XV
Instantaneous Water Demands for Commercial Areas

Type of Establishment	Basis of Flow Demand
Barber Shop	1.5 gpm per chair
Beauty Shop	1.5 gpm per chair
Dentist Office	2.0 gpm per chair
Department Store*	0.5-1.0-1.5 gpm per employee
Drug Store	3.0 gpm
With Fountain Service	add 3.0 gpm
Serving Meals	add 1.0 gpm per seat
Industrila Plant**	0.5 gpm per employee
Laundry	20.0-40.0-60.0 gpm
Launderette	5.0 gpm per unit
Meat Market, Super Market	1.0 gpm per 100 square feet floor area
Motel, Hotel	2.0 gpm per unit
Office Building*	0.2 gpm per 100 square feet floor area
Physician's Office	2.0 gpm per examining room
Restaurant	1.0 gpm per seat
Single Service	3.0-6.0-10.0 gpm
Drive-In	0.5-1.0-3.0 gpm per car space
Service Station	3.0-5.0-8.0 gpm per wash rack
Theatre	0.3-1.0-2.0 gpm per seat
Drive-In	0.4 gpm per car space
Other Establishments***	0.3-1.0-3.0 gpm per employee

*Including customer service.
**Not including process water.
***Non-water using establishments.



Wastewater Collection Master Plan for Monterra

Prepared by Otak, Inc.
51 W. Third Street, Suite 201
Tempe, AZ 85281
(480) 557-6670

June 2005

Otak Project No. 12633

KENNETH A. NELSON, P.E.

Table of Contents
Monterra

Existing Conditions

The proposed Monterra private, residential development is on approximately 870 acres located in a portion of Sections 29, 31 and 32, T4S, R9E, and Section 6, T5S, R9E of the Gila & Salt River Base and Meridian in Pinal County, Arizona. The site is bounded by Attaway Road to the west. Hunt Highway is located approximately 800 feet to the north and the Gila River is directly south of the site (See Figure 1 – *Vicinity Map).* The site presently consists of 29 irrigated fields of approximately 30 acres each.

There are no existing wastewater mains in the immediate area of the proposed development. A proposed Wastewater Treatment Facility is to be located just east of the Monterra project boundary about 1300' north of the center of Section 32. The WWTF will be the outfall for the entire Monterra project. The Town of Florence will be the water and sewer provider for this site.

Site topography was obtained by ground survey methods and mapping was provided by M2 Group, Inc. The site topography is gently terraced sloping from the north/northeast to the south/southwest at an average grade of approximately 0.3%.

System Analysis

In order to determine the peak flow, an average flow and a *peaking factor* were used with respect to the proposed development for the downstream pipe. The Town of Florence guidelines were referenced for Unit Daily Design Flows and Peaking Factors and utilized for sewer design. This site has a total of 3,626 residential dwelling units (DU). This number was used to analyze the wastewater collection requirements for this site. See Appendix C for Daily Design Flows and Peaking Factor Tables.

An average flow of 100 gallons per capita per day and 2.5 capita per DU were assumed for the residential analysis. A peaking factor of 1.87 was used for the proposed development. The peak sewer flow for Monterra was calculated to be approximately 1,927,483 gallons per day (gpd), or 1,339 gpm. A wet weather factor of 250 gallons per acre per day is added to the peak flow resulting in a total peak flow of 164,246 gpd, or 114 gpm for this site. The total flow for Monterra was found to be 2,091,730 gpd or 1,453 gpm. See Appendix B for flow calculations.

The minimum allowable slope is defined by the Arizona Department of Environmental Quality as a slope that will produce a minimum flow velocity of two feet per second (2 fps) when flowing full (see Appendix B). Pipe flow capacity was determined using Manning's equation for an 8-inch pipe size. A minimum slope of 0.0033 ft/ft was determined to allow for a velocity of two feet per second with a resulting capacity of 313 gpm (0.70 cfs) for an 8-inch diameter pipe (n=0.013) flowing full. Using the same analysis, a 10" diameter pipe with a minimum slope of 0.0024 ft/ft has a capacity of 490 gpm. A 12" diameter pipe with a minimum slope of 0.0019 ft/ft has a capacity of 705 gpm. Monterra was designed with a slope of 0.0033 ft/ft.

See Table 2 in Appendix A for the entire design. The proposed 8-inch gravity sewer has adequate capacity for the Monterra development.

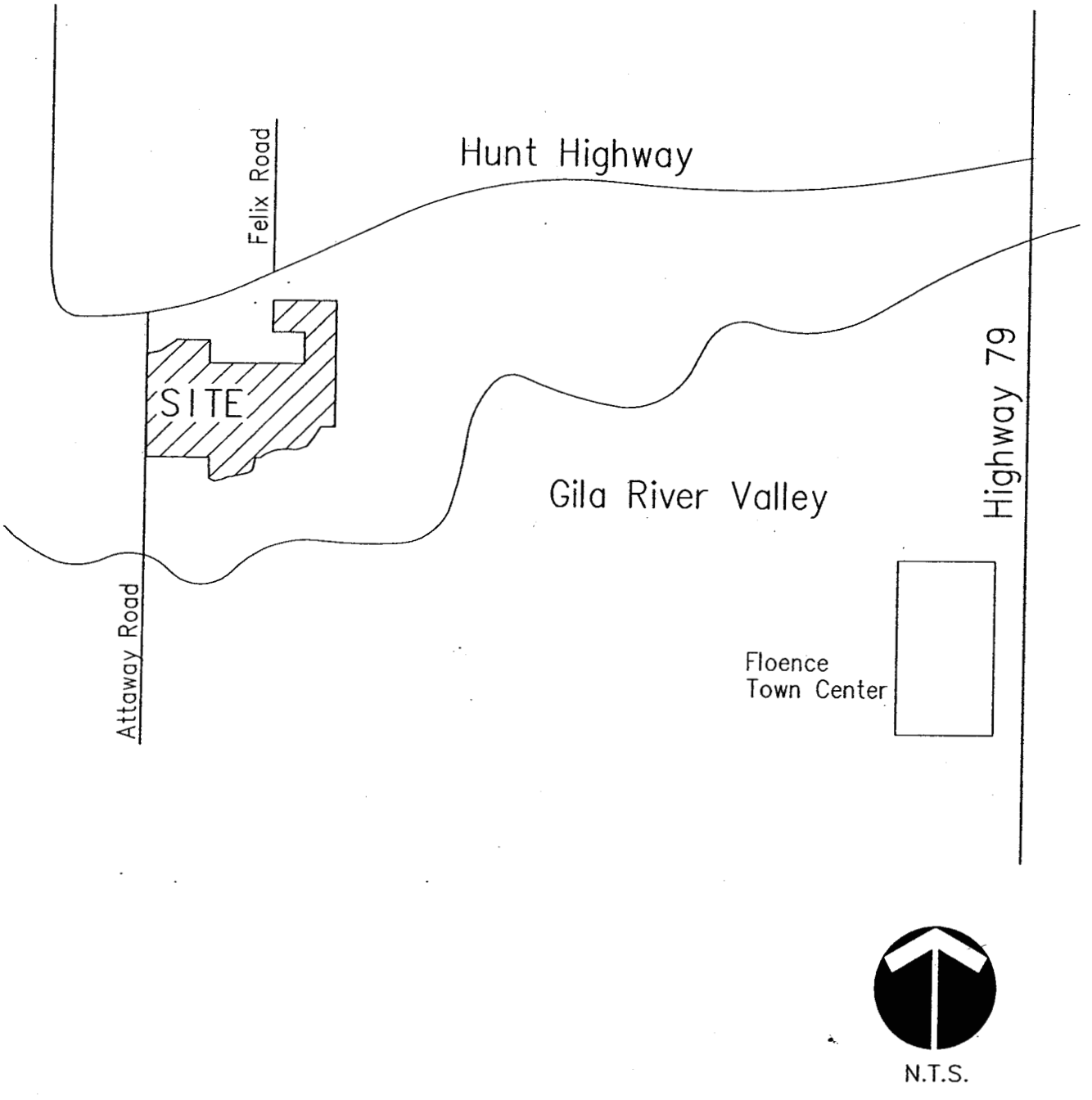
Figure 3 – Layout Map identifies the pipe layout with directional flow arrows. A portion of the project is gravity fed to a proposed Lift Station located in Monterra South (Phase 1), and another portion is gravity fed to a proposed Lift Station located in Phase 2. Both of the proposed Lift Stations will be piped directly to the Wastewater Treatment Facility.

Conclusions

A gravity wastewater collection system will adequately serve the development utilizing 8-inch diameter, 10-inch diameter, 12-inch diameter and 15-inch diameter gravity pipes with at least the minimum allowable slope for each pipe size.

The entire sewer system shall have a minimum of 5 feet of cover.

The final design for sewer layout will utilize a grading plan in order to maintain minimum cover, provide pipe sizes for required capacity, and provide service to potential offsite collection areas.



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otak Incorporated
51 W. Third St., Suite 201
Tempe, Arizona 85281
Phone: (480) 557-6670
FAX: (480) 557-6506

MONTERRA

VICINITY MAP

12633
Project No.
SMP-FIG-1
File No.
FIGURE 1
Sheet No.

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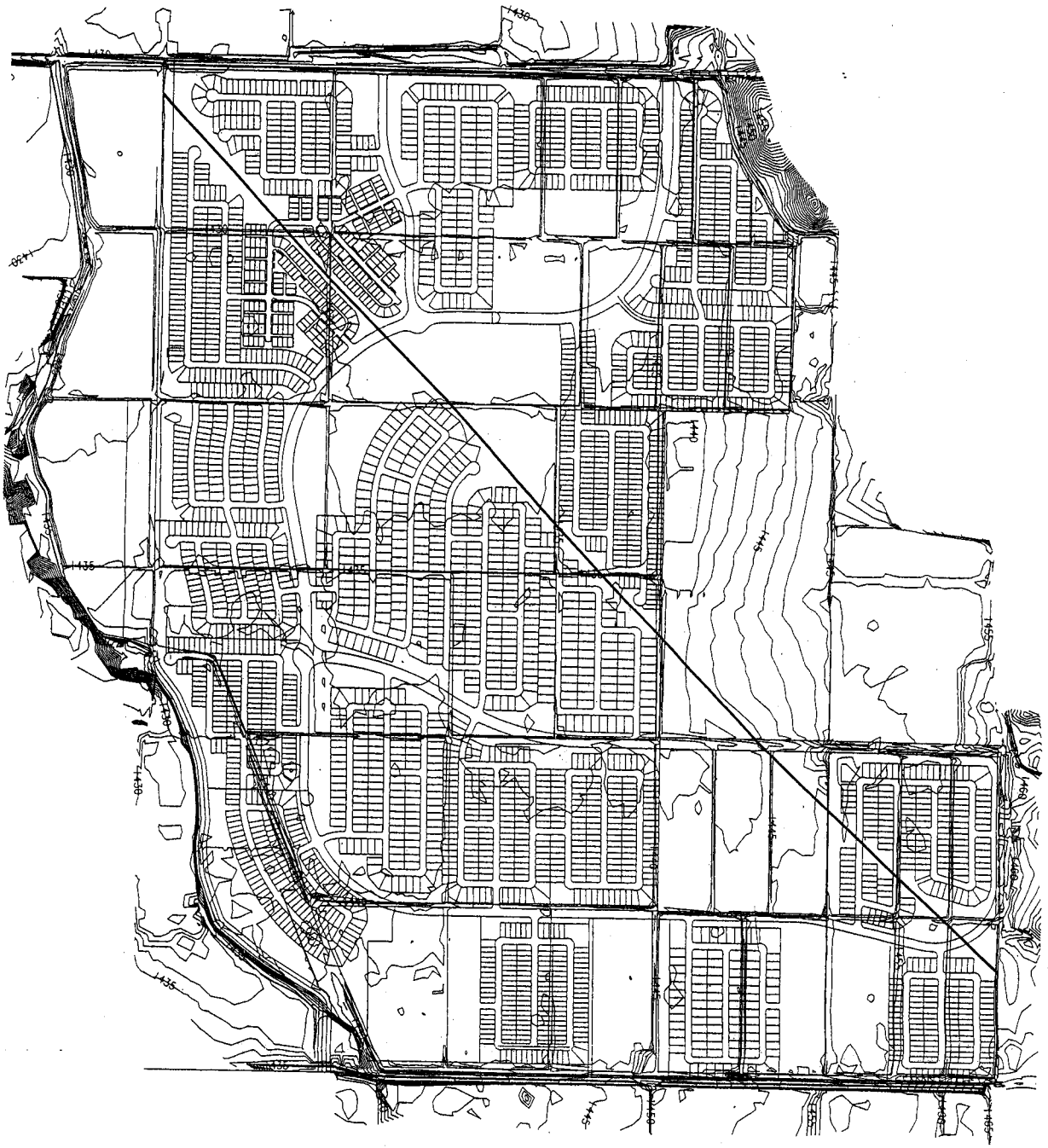


N.T.S.

MONTERRA

Topography Map

Project No.
Figure 2
Sheet No.

NO.	DATE	BY	Checked & Approved	Initial Issue by : REVISIONS

Appendix A —

Wastewater Collection Masterplan Calculations

Scenario: Base

Manhole Report

Label	Ground Elevation (ft)	Sump Elevation (ft)	Matchline Offset (ft)	Structure Depth (ft)	Invert Out Elevation (ft)	Invert In Elevation 1 (ft)	Invert In Elevation 2 (ft)	Invert In Elevation 3 (ft)
MH-1	1,432.20	1,412.12	0.10	20.08	1,412.12	1,412.22	1,412.22	N/A
MH-2	1,431.00	1,412.76	0.10	18.24	1,412.76	1,412.86	1,412.86	N/A
MH-3	1,431.30	1,413.22	0.10	18.08	1,413.22	1,413.32	1,413.32	N/A
MH-4	1,433.30	1,413.92	0.10	19.38	1,413.92	1,414.02	N/A	N/A
MH-5	1,433.40	1,414.61	0.10	18.79	1,414.61	1,414.71	N/A	N/A
MH-6	1,433.50	1,415.30	0.10	18.20	1,415.30	1,415.40	N/A	N/A
MH-7	1,433.50	1,416.00	0.10	17.50	1,416.00	1,416.10	N/A	N/A
MH-8	1,433.70	1,417.75	0.10	15.95	1,417.75	1,417.85	N/A	N/A
MH-9	1,436.80	1,418.67	0.10	18.13	1,418.67	1,418.77	N/A	N/A
MH-10	1,437.00	1,419.60	0.10	17.40	1,419.60	1,419.70	N/A	N/A
MH-11	1,437.00	1,420.49	0.10	16.51	1,420.49	1,420.59	N/A	N/A
MH-12	1,438.90	1,423.24	0.10	15.66	1,423.24	1,423.34	N/A	N/A
MH-13	1,438.70	1,423.82	0.10	14.88	1,423.82	1,423.92	N/A	N/A
MH-14	1,439.00	1,424.41	0.10	14.59	1,424.41	1,424.51	N/A	N/A
MH-15	1,439.30	1,425.00	0.10	14.30	1,425.00	1,425.10	N/A	N/A
MH-16	1,440.80	1,425.61	0.10	15.19	1,425.61	1,425.71	1,425.71	N/A
MH-17	1,440.70	1,426.22	0.10	14.48	1,426.22	1,426.32	N/A	N/A
MH-18	1,440.30	1,426.75	0.10	13.55	1,426.75	1,426.85	1,426.85	N/A
MH-19	1,440.30	1,427.74	0.10	12.56	1,427.74	1,427.84	1,427.84	N/A
MH-20	1,439.90	1,429.09	0.00	10.81	1,429.09	1,429.09	N/A	N/A
MH-21	1,441.40	1,430.35	0.00	11.05	1,430.35	1,430.35	N/A	N/A
MH-22	1,441.50	1,431.60	0.00	9.90	1,431.60	1,431.60	N/A	N/A
MH-23	1,445.10	1,432.85	0.10	12.25	1,432.85	1,432.95	1,432.95	N/A
MH-24	1,444.90	1,434.43	0.00	10.47	1,434.43	1,434.43	N/A	N/A
MH-25	1,447.90	1,435.87	0.10	12.03	1,435.87	1,435.97	1,435.97	N/A
MH-26	1,452.60	1,437.37	0.10	15.23	1,437.37	1,437.47	1,437.47	N/A
MH-27	1,452.80	1,438.42	0.10	14.38	1,438.42	1,438.52	N/A	N/A
MH-28	1,436.10	1,423.08	0.10	13.02	1,423.08	1,423.18	N/A	N/A
MH-29	1,435.50	1,424.31	0.10	11.19	1,424.31	1,424.41	1,424.41	N/A
MH-30	1,435.60	1,425.57	0.10	10.03	1,425.57	1,425.67	N/A	N/A
MH-31	1,438.00	1,426.82	0.10	11.18	1,426.82	1,426.92	N/A	N/A
MH-32	1,431.60	1,412.68	0.10	18.92	1,412.68	1,412.78	N/A	N/A
MH-33	1,431.40	1,413.01	0.10	18.39	1,413.01	1,413.11	N/A	N/A
MH-34	1,431.50	1,413.35	0.10	18.15	1,413.35	1,413.45	1,413.45	N/A
MH-35	1,431.60	1,413.94	0.10	17.66	1,413.94	1,414.04	N/A	N/A
MH-36	1,431.50	1,414.30	0.10	17.20	1,414.30	1,414.40	N/A	N/A
MH-37	1,431.50	1,414.67	0.10	16.83	1,414.67	1,414.77	1,414.77	N/A
MH-38	1,431.60	1,415.28	0.10	16.32	1,415.28	1,415.38	1,415.38	N/A
MH-39	1,431.40	1,416.67	0.10	14.73	1,416.67	1,416.77	1,416.77	N/A
MH-40	1,431.40	1,417.92	0.10	13.48	1,417.92	1,418.02	N/A	N/A
MH-41	1,431.80	1,418.85	0.10	12.95	1,418.85	1,418.95	1,418.95	N/A
MH-42	1,433.70	1,419.57	0.10	14.13	1,419.57	1,419.67	N/A	N/A
MH-43	1,433.70	1,420.29	0.10	13.41	1,420.29	1,420.39	N/A	N/A
MH-44	1,434.20	1,423.87	0.10	10.33	1,423.87	1,423.97	N/A	N/A
MH-45	1,434.10	1,424.24	0.10	9.86	1,424.24	1,424.34	N/A	N/A
MH-46	1,431.40	1,415.21	0.10	16.19	1,415.21	1,415.31	N/A	N/A
MH-47	1,431.50	1,415.78	0.10	15.72	1,415.78	1,415.88	1,415.88	N/A
MH-48	1,431.40	1,417.19	0.00	14.21	1,417.19	1,417.19	N/A	N/A
MH-49	1,430.00	1,418.49	0.10	11.51	1,418.49	1,418.59	1,418.59	N/A
MH-50	1,429.90	1,419.05	0.10	10.85	1,419.05	1,419.15	N/A	N/A
MH-51	1,429.80	1,419.85	0.10	9.95	1,419.85	1,419.95	N/A	N/A
MH-52	1,429.70	1,421.27	0.00	8.43	1,421.27	N/A	N/A	N/A

Manhole Report

Label	Ground Elevation (ft)	Sump Elevation (ft)	Matchline Offset (ft)	Structure Depth (ft)	Invert Out Elevation (ft)	Invert In Elevation 1 (ft)	Invert In Elevation 2 (ft)	Invert In Elevation 3 (ft)
MH-53	1,430.00	1,419.07	0.10	10.93	1,419.07	1,419.17	1,419.17	N/A
MH-54	1,429.80	1,420.22	0.00	9.58	1,420.22	1,420.22	N/A	N/A
MH-55	1,429.60	1,421.26	0.10	8.34	1,421.26	1,421.36	1,421.36	N/A
MH-56	1,429.70	1,422.29	0.00	7.41	1,422.29	N/A	N/A	N/A
MH-57	1,429.70	1,422.18	0.00	7.52	1,422.18	N/A	N/A	N/A
MH-58	1,430.00	1,420.12	0.10	9.88	1,420.12	1,420.22	N/A	N/A
MH-59	1,429.80	1,421.26	0.00	8.54	1,421.26	1,421.26	N/A	N/A
MH-60	1,429.70	1,422.29	0.00	7.41	1,422.29	N/A	N/A	N/A
MH-61	1,431.40	1,416.84	0.10	14.56	1,416.84	1,416.94	N/A	N/A
MH-62	1,430.20	1,418.59	0.10	11.61	1,418.59	1,418.69	1,418.69	N/A
MH-63	1,430.10	1,419.48	0.00	10.62	1,419.48	N/A	N/A	N/A
MH-64	1,431.50	1,419.91	0.10	11.59	1,419.91	1,420.01	1,420.01	N/A
MH-65	1,430.90	1,420.46	0.10	10.44	1,420.46	1,420.56	1,420.56	N/A
MH-66	1,430.10	1,421.45	0.10	8.65	1,421.45	1,421.55	N/A	N/A
MH-67	1,431.10	1,422.64	0.10	8.46	1,422.64	1,422.74	1,422.74	N/A
MH-68	1,430.20	1,423.79	0.00	6.41	1,423.79	N/A	N/A	N/A
MH-69	1,431.20	1,423.48	0.00	7.72	1,423.48	N/A	N/A	N/A
MH-70	1,431.30	1,421.55	0.00	9.75	1,421.55	1,421.55	N/A	N/A
MH-71	1,430.10	1,422.54	0.10	7.56	1,422.54	1,422.64	1,422.64	N/A
MH-72	1,431.40	1,423.53	0.00	7.87	1,423.53	1,423.53	N/A	N/A
MH-73	1,430.50	1,424.83	0.00	5.67	1,424.83	N/A	N/A	N/A
MH-74	1,431.20	1,423.36	0.00	7.84	1,423.36	N/A	N/A	N/A
MH-75	1,432.00	1,420.46	0.10	11.54	1,420.46	1,420.56	N/A	N/A
MH-76	1,431.10	1,421.18	0.10	9.92	1,421.18	1,421.28	1,421.28	N/A
MH-77	1,431.40	1,421.94	0.10	9.46	1,421.94	1,422.04	N/A	N/A
MH-78	1,431.80	1,422.39	0.00	9.41	1,422.39	N/A	N/A	N/A
MH-79	1,431.50	1,422.64	0.00	8.86	1,422.64	N/A	N/A	N/A
MH-80	1,431.80	1,412.95	0.10	18.85	1,412.95	1,413.05	1,413.05	N/A
MH-81	1,431.80	1,413.12	0.10	18.68	1,413.12	1,413.22	N/A	N/A
MH-82	1,432.00	1,413.51	0.10	18.49	1,413.51	1,413.61	N/A	N/A
MH-83	1,431.90	1,413.79	0.10	18.11	1,413.79	1,413.89	N/A	N/A
MH-84	1,431.90	1,414.47	0.00	17.43	1,414.47	N/A	N/A	N/A
MH-85	1,430.80	1,414.07	0.10	16.73	1,414.07	1,414.17	N/A	N/A
MH-86	1,430.60	1,414.50	0.10	16.10	1,414.50	1,414.60	N/A	N/A
MH-87	1,430.90	1,415.32	0.10	15.58	1,415.32	1,415.42	1,415.42	1,415.42
MH-88	1,430.80	1,416.40	0.00	14.40	1,416.40	N/A	N/A	N/A
MH-89	1,430.80	1,416.73	0.10	14.07	1,416.73	1,416.83	1,416.83	N/A
MH-90	1,430.80	1,417.08	0.10	13.72	1,417.08	1,417.18	N/A	N/A
MH-91	1,430.70	1,417.44	0.10	13.26	1,417.44	1,417.54	N/A	N/A
MH-92	1,431.20	1,418.99	0.00	12.21	1,418.99	N/A	N/A	N/A
MH-93	1,429.50	1,417.29	0.10	12.21	1,417.29	1,417.39	N/A	N/A
MH-94	1,429.50	1,417.60	0.10	11.90	1,417.60	1,417.70	N/A	N/A
MH-95	1,429.70	1,418.66	0.10	11.04	1,418.66	1,418.76	1,418.76	1,418.76
MH-96	1,430.20	1,419.03	0.10	11.17	1,419.03	1,419.13	N/A	N/A
MH-97	1,431.80	1,420.20	0.10	11.60	1,420.20	1,420.30	N/A	N/A
MH-98	1,431.40	1,421.58	0.10	9.82	1,421.58	1,421.68	N/A	N/A
MH-99	1,431.50	1,421.97	0.00	9.53	1,421.97	N/A	N/A	N/A
MH-100	1,429.70	1,419.13	0.10	10.57	1,419.13	1,419.23	1,419.23	N/A
MH-101	1,430.30	1,419.48	0.10	10.82	1,419.48	1,419.58	N/A	N/A
MH-102	1,431.30	1,421.23	0.00	10.07	1,421.23	N/A	N/A	N/A
MH-103	1,430.10	1,419.46	0.10	10.64	1,419.46	1,419.56	N/A	N/A
MH-104	1,430.00	1,420.76	0.00	9.24	1,420.76	N/A	N/A	N/A

Manhole Report

Label	Ground Elevation (ft)	Sump Elevation (ft)	Matchline Offset (ft)	Structure Depth (ft)	Invert Out Elevation (ft)	Invert In Elevation 1 (ft)	Invert In Elevation 2 (ft)	Invert In Elevation 3 (ft)
MH-105	1,430.70	1,416.59	0.10	14.11	1,416.59	1,416.69	1,416.69	N/A
MH-106	1,430.70	1,417.86	0.00	12.84	1,417.86	1,417.86	N/A	N/A
MH-107	1,429.10	1,419.01	0.10	10.09	1,419.01	1,419.11	N/A	N/A
MH-108	1,429.20	1,420.00	0.10	9.20	1,420.00	1,420.10	1,420.10	N/A
MH-109	1,429.30	1,421.31	0.00	7.99	1,421.31	N/A	N/A	N/A
MH-110	1,430.00	1,420.81	0.00	9.19	1,420.81	N/A	N/A	N/A
MH-111	1,430.40	1,417.37	0.00	13.03	1,417.37	N/A	N/A	N/A
MH-112	1,430.90	1,413.53	0.10	17.37	1,413.53	1,413.63	N/A	N/A
MH-113	1,430.70	1,413.96	0.10	16.74	1,413.96	1,414.06	N/A	N/A
MH-114	1,430.60	1,415.65	0.10	14.95	1,415.65	1,415.75	1,415.75	N/A
MH-115	1,430.60	1,416.64	0.10	13.96	1,416.64	1,416.74	N/A	N/A
MH-116	1,430.50	1,417.79	0.00	12.71	1,417.79	1,417.79	N/A	N/A
MH-117	1,430.60	1,418.95	0.00	11.65	1,418.95	1,418.95	N/A	N/A
MH-118	1,430.50	1,420.03	0.00	10.47	1,420.03	N/A	N/A	N/A
MH-119	1,430.30	1,416.74	0.00	13.56	1,416.74	N/A	N/A	N/A
MH-120	1,430.80	1,414.17	0.10	16.63	1,414.17	1,414.27	N/A	N/A
MH-121	1,431.00	1,414.61	0.10	16.39	1,414.61	1,414.71	N/A	N/A
MH-122	1,432.20	1,414.81	0.10	17.39	1,414.81	1,414.91	1,414.91	N/A
MH-123	1,433.30	1,415.57	0.10	17.73	1,415.57	1,415.67	N/A	N/A
MH-124	1,433.40	1,416.50	0.10	16.90	1,416.50	1,416.60	N/A	N/A
MH-125	1,433.60	1,417.76	0.10	15.84	1,417.76	1,417.86	1,417.86	N/A
MH-126	1,433.60	1,418.75	0.10	14.85	1,418.75	1,418.85	1,418.85	N/A
MH-127	1,433.70	1,419.74	0.00	13.96	1,419.74	N/A	N/A	N/A
MH-128	1,433.60	1,418.23	0.00	15.37	1,418.23	N/A	N/A	N/A
MH-129	1,432.30	1,415.80	0.10	16.50	1,415.80	1,415.90	1,415.90	N/A
MH-130	1,433.40	1,416.56	0.10	16.84	1,416.56	1,416.66	N/A	N/A
MH-131	1,433.50	1,417.49	0.10	16.01	1,417.49	1,417.59	N/A	N/A
MH-132	1,433.60	1,418.60	0.00	15.00	1,418.60	N/A	N/A	N/A
MH-133	1,432.50	1,416.79	0.10	15.71	1,416.79	1,416.89	N/A	N/A
MH-134	1,433.50	1,417.55	0.10	15.95	1,417.55	1,417.65	N/A	N/A
MH-135	1,433.60	1,418.48	0.10	15.12	1,418.48	1,418.58	N/A	N/A
MH-136	1,433.70	1,419.65	0.00	14.05	1,419.65	N/A	N/A	N/A
MH-137	1,433.60	1,419.06	0.10	14.54	1,419.06	1,419.16	N/A	N/A
MH-138	1,433.70	1,419.65	0.10	14.05	1,419.65	1,419.75	N/A	N/A
MH-139	1,433.70	1,420.00	0.10	13.70	1,420.00	1,420.10	1,420.10	1,420.10
MH-140	1,433.70	1,421.01	0.10	12.69	1,421.01	1,421.11	N/A	N/A
MH-141	1,433.80	1,421.54	0.10	12.26	1,421.54	1,421.64	N/A	N/A
MH-142	1,437.00	1,422.73	0.10	14.27	1,422.73	1,422.83	N/A	N/A
MH-143	1,436.90	1,423.36	0.00	13.54	1,423.36	N/A	N/A	N/A
MH-144	1,433.70	1,420.53	0.10	13.17	1,420.53	1,420.63	N/A	N/A
MH-145	1,437.00	1,421.85	0.10	15.15	1,421.85	1,421.95	N/A	N/A
MH-146	1,437.10	1,422.44	0.10	14.66	1,422.44	1,422.54	1,422.54	N/A
MH-147	1,436.90	1,423.43	0.00	13.47	1,423.43	N/A	N/A	N/A
MH-148	1,437.00	1,423.43	0.00	13.57	1,423.43	N/A	N/A	N/A
MH-149	1,433.90	1,421.01	0.10	12.89	1,421.01	1,421.11	1,421.11	N/A
MH-150	1,434.00	1,421.54	0.10	12.46	1,421.54	1,421.64	N/A	N/A
MH-151	1,436.90	1,422.90	0.10	14.00	1,422.90	1,423.00	N/A	N/A
MH-152	1,437.00	1,423.29	0.00	13.71	1,423.29	N/A	N/A	N/A
MH-153	1,433.80	1,421.80	0.00	12.00	1,421.80	N/A	N/A	N/A
MH-154	1,437.10	1,421.38	0.10	15.72	1,421.38	1,421.48	1,421.48	N/A
MH-155	1,437.20	1,422.95	0.00	14.25	1,422.95	1,422.95	N/A	N/A
MH-156	1,438.70	1,424.42	0.10	14.28	1,424.42	1,424.52	N/A	N/A

Scenario: Base

Manhole Report

Label	Ground Elevation (ft)	Sump Elevation (ft)	Matchline Offset (ft)	Structure Depth (ft)	Invert Out Elevation (ft)	Invert In Elevation 1 (ft)	Invert In Elevation 2 (ft)	Invert In Elevation 3 (ft)
MH-157	1,439.70	1,425.25	0.00	14.45	1,425.25	N/A	N/A	N/A
MH-158	1,437.10	1,422.37	0.10	14.73	1,422.37	1,422.47	1,422.47	N/A
MH-159	1,437.30	1,423.49	0.00	13.81	1,423.49	1,423.49	N/A	N/A
MH-160	1,439.00	1,424.52	0.10	14.48	1,424.52	1,424.62	1,424.62	N/A
MH-161	1,439.50	1,425.51	0.00	13.99	1,425.51	1,425.51	N/A	N/A
MH-162	1,439.10	1,425.41	0.00	13.69	1,425.41	N/A	N/A	N/A
MH-163	1,437.20	1,423.36	0.10	13.84	1,423.36	1,423.46	1,423.46	N/A
MH-164	1,438.80	1,424.48	0.00	14.32	1,424.48	1,424.48	N/A	N/A
MH-165	1,438.80	1,425.33	0.00	13.47	1,425.33	N/A	N/A	N/A
MH-166	1,437.80	1,424.46	0.00	13.34	1,424.46	N/A	N/A	N/A
MH-167	1,431.50	1,414.90	0.10	16.60	1,414.90	1,415.00	1,415.00	N/A
MH-168	1,431.70	1,415.61	0.10	16.09	1,415.61	1,415.71	N/A	N/A
MH-169	1,432.90	1,416.21	0.10	16.69	1,416.21	1,416.31	1,416.31	N/A
MH-170	1,432.80	1,417.07	0.10	15.73	1,417.07	1,417.17	N/A	N/A
MH-171	1,432.70	1,417.79	0.10	14.91	1,417.79	1,417.89	N/A	N/A
MH-172	1,432.80	1,418.50	0.10	14.30	1,418.50	1,418.60	N/A	N/A
MH-173	1,432.90	1,419.21	0.10	13.69	1,419.21	1,419.31	N/A	N/A
MH-174	1,433.00	1,420.24	0.10	12.76	1,420.24	1,420.34	1,420.34	N/A
MH-175	1,433.10	1,421.30	0.10	11.80	1,421.30	1,421.40	N/A	N/A
MH-176	1,433.50	1,422.31	0.00	11.19	1,422.31	1,422.31	N/A	N/A
MH-177	1,435.80	1,423.21	0.10	12.59	1,423.21	1,423.31	N/A	N/A
MH-178	1,435.80	1,423.60	0.00	12.20	1,423.60	N/A	N/A	N/A
MH-179	1,436.00	1,421.43	0.00	14.57	1,421.43	1,421.43	N/A	N/A
MH-180	1,435.80	1,422.52	0.10	13.28	1,422.52	1,422.62	N/A	N/A
MH-181	1,436.00	1,423.02	0.10	12.98	1,423.02	1,423.12	1,423.12	N/A
MH-182	1,436.00	1,423.95	0.00	12.05	1,423.95	N/A	N/A	N/A
MH-183	1,435.90	1,423.78	0.00	12.12	1,423.78	N/A	N/A	N/A
MH-184	1,432.70	1,417.27	0.10	15.43	1,417.27	1,417.37	N/A	N/A
MH-185	1,432.90	1,418.33	0.10	14.57	1,418.33	1,418.43	N/A	N/A
MH-186	1,432.90	1,418.94	0.10	13.96	1,418.94	1,419.04	N/A	N/A
MH-187	1,433.00	1,419.55	0.10	13.45	1,419.55	1,419.65	N/A	N/A
MH-188	1,433.40	1,421.30	0.00	12.10	1,421.30	1,421.30	N/A	N/A
MH-189	1,435.90	1,422.95	0.10	12.95	1,422.95	1,423.05	N/A	N/A
MH-190	1,436.00	1,423.43	0.00	12.57	1,423.43	N/A	N/A	N/A
MH-191	1,439.50	1,426.43	0.10	13.07	1,426.43	1,426.53	1,426.53	N/A
MH-192	1,439.60	1,427.19	0.10	12.41	1,427.19	1,427.29	N/A	N/A
MH-193	1,441.10	1,428.02	0.10	13.08	1,428.02	1,428.12	N/A	N/A
MH-194	1,441.20	1,428.85	0.10	12.35	1,428.85	1,428.95	N/A	N/A
MH-195	1,441.40	1,429.67	0.10	11.73	1,429.67	1,429.77	N/A	N/A
MH-196	1,441.50	1,430.50	0.10	11.00	1,430.50	1,430.60	N/A	N/A
MH-197	1,441.10	1,431.32	0.10	9.78	1,431.32	1,431.42	N/A	N/A
MH-198	1,441.00	1,431.83	0.00	9.17	1,431.83	N/A	N/A	N/A
MH-199	1,438.60	1,427.47	0.10	11.13	1,427.47	1,427.57	N/A	N/A
MH-200	1,439.00	1,428.23	0.10	10.77	1,428.23	1,428.33	N/A	N/A
MH-201	1,437.90	1,428.99	0.10	8.91	1,428.99	1,429.09	N/A	N/A
MH-202	1,439.20	1,429.75	0.10	9.45	1,429.75	1,429.85	N/A	N/A
MH-203	1,439.00	1,430.51	0.10	8.49	1,430.51	1,430.61	N/A	N/A
MH-204	1,440.90	1,431.27	0.10	9.63	1,431.27	1,431.37	N/A	N/A
MH-205	1,441.00	1,431.76	0.00	9.24	1,431.76	N/A	N/A	N/A
MH-206	1,436.00	1,420.01	0.10	15.99	1,420.01	1,420.11	1,420.11	N/A
MH-207	1,438.60	1,421.22	0.00	17.38	1,421.22	1,421.22	N/A	N/A
MH-208	1,438.80	1,422.31	0.10	16.49	1,422.31	1,422.41	1,422.41	N/A

Manhole Report

Label	Ground Elevation (ft)	Sump Elevation (ft)	Matchline Offset (ft)	Structure Depth (ft)	Invert Out Elevation (ft)	Invert In Elevation 1 (ft)	Invert In Elevation 2 (ft)	Invert In Elevation 3 (ft)
MH-209	1,438.90	1,422.70	0.10	16.20	1,422.70	1,422.80	N/A	N/A
MH-210	1,438.90	1,423.02	0.10	15.88	1,423.02	1,423.12	N/A	N/A
MH-211	1,438.80	1,423.17	0.00	15.63	1,423.17	N/A	N/A	N/A
MH-212	1,435.90	1,420.37	0.10	15.53	1,420.37	1,420.47	N/A	N/A
MH-213	1,435.90	1,421.43	0.10	14.47	1,421.43	1,421.53	1,421.53	N/A
MH-214	1,438.60	1,422.93	0.00	15.67	1,422.93	1,422.93	N/A	N/A
MH-215	1,438.80	1,424.34	0.00	14.46	1,424.34	1,424.34	N/A	N/A
MH-216	1,439.00	1,425.74	0.10	13.26	1,425.74	1,425.84	N/A	N/A
MH-217	1,439.00	1,426.74	0.00	12.26	1,426.74	N/A	N/A	N/A
MH-218	1,436.20	1,422.49	0.10	13.71	1,422.49	1,422.59	1,422.59	N/A
MH-219	1,438.70	1,423.97	0.00	14.73	1,423.97	1,423.97	N/A	N/A
MH-220	1,438.80	1,425.36	0.00	13.44	1,425.36	1,425.36	N/A	N/A
MH-221	1,439.00	1,426.73	0.00	12.27	1,426.73	N/A	N/A	N/A
MH-222	1,440.80	1,426.20	0.10	14.60	1,426.20	1,426.30	N/A	N/A
MH-223	1,440.90	1,426.80	0.10	14.10	1,426.80	1,426.90	1,426.90	N/A
MH-224	1,440.80	1,427.46	0.00	13.34	1,427.46	N/A	N/A	N/A
MH-225	1,441.10	1,428.00	0.00	13.10	1,428.00	1,428.00	N/A	N/A
MH-226	1,441.10	1,429.11	0.10	11.99	1,429.11	1,429.21	N/A	N/A
MH-227	1,441.20	1,429.77	0.10	11.43	1,429.77	1,429.87	1,429.87	N/A
MH-228	1,441.10	1,430.30	0.00	10.80	1,430.30	N/A	N/A	N/A
MH-229	1,441.30	1,430.33	0.10	10.97	1,430.33	1,430.43	1,430.43	N/A
MH-230	1,441.30	1,431.22	0.00	10.08	1,431.22	N/A	N/A	N/A
MH-231	1,440.90	1,431.19	0.00	9.71	1,431.19	N/A	N/A	N/A
MH-232	1,440.30	1,427.97	0.00	12.33	1,427.97	1,427.97	N/A	N/A
H-233	1,440.30	1,429.09	0.10	11.21	1,429.09	1,429.19	N/A	N/A
MH-234	1,440.40	1,429.53	0.10	10.87	1,429.53	1,429.63	N/A	N/A
MH-235	1,440.50	1,430.47	0.00	10.03	1,430.47	N/A	N/A	N/A
MH-236	1,437.00	1,425.09	0.10	11.91	1,425.09	1,425.19	N/A	N/A
MH-237	1,438.00	1,425.52	0.10	12.48	1,425.52	1,425.62	N/A	N/A
MH-238	1,438.10	1,425.90	0.10	12.20	1,425.90	1,426.00	1,426.00	N/A
MH-239	1,438.30	1,427.51	0.00	10.79	1,427.51	1,427.51	N/A	N/A
MH-240	1,438.50	1,429.02	0.10	9.48	1,429.02	1,429.12	N/A	N/A
MH-241	1,438.20	1,430.04	0.00	8.16	1,430.04	1,430.04	N/A	N/A
MH-242	1,438.20	1,430.85	0.00	7.35	1,430.85	N/A	N/A	N/A
MH-243	1,438.00	1,426.93	0.10	11.07	1,426.93	1,427.03	1,427.03	N/A
MH-244	1,438.10	1,428.53	0.00	9.57	1,428.53	1,428.53	N/A	N/A
MH-245	1,438.30	1,429.89	0.00	8.41	1,429.89	N/A	N/A	N/A
MH-246	1,437.90	1,427.95	0.10	9.95	1,427.95	1,428.05	N/A	N/A
MH-247	1,438.10	1,429.57	0.00	8.53	1,429.57	1,429.57	N/A	N/A
MH-248	1,438.20	1,431.07	0.00	7.13	1,431.07	N/A	N/A	N/A
MH-249	1,440.20	1,428.56	0.10	11.64	1,428.56	1,428.66	1,428.66	N/A
MH-250	1,440.30	1,430.07	0.00	10.23	1,430.07	1,430.07	N/A	N/A
MH-251	1,440.50	1,431.45	0.10	9.05	1,431.45	1,431.55	N/A	N/A
MH-252	1,440.40	1,432.48	0.00	7.92	1,432.48	1,432.48	N/A	N/A
MH-253	1,441.80	1,433.40	0.00	8.40	1,433.40	N/A	N/A	N/A
MH-254	1,440.20	1,429.59	0.10	10.61	1,429.59	1,429.69	1,429.69	N/A
MH-255	1,440.40	1,430.98	0.00	9.42	1,430.98	1,430.98	N/A	N/A
MH-256	1,440.60	1,432.27	0.00	8.33	1,432.27	N/A	N/A	N/A
MH-257	1,441.50	1,430.61	0.10	10.89	1,430.61	1,430.71	N/A	N/A
MH-258	1,441.60	1,432.06	0.00	9.54	1,432.06	1,432.06	N/A	N/A
MH-259	1,441.80	1,433.39	0.00	8.41	1,433.39	N/A	N/A	N/A
H-260	1,437.90	1,427.71	0.10	10.19	1,427.71	1,427.81	1,427.81	N/A

Scenario: Base

Manhole Report

Label	Ground Elevation (ft)	Sump Elevation (ft)	Matchline Offset (ft)	Structure Depth (ft)	Invert Out Elevation (ft)	Invert In Elevation 1 (ft)	Invert In Elevation 2 (ft)	Invert In Elevation 3 (ft)
MH-261	1,438.10	1,429.25	0.00	8.85	1,429.25	1,429.25	N/A	N/A
MH-262	1,438.20	1,430.69	0.10	7.51	1,430.69	1,430.79	N/A	N/A
MH-263	1,438.40	1,431.71	0.00	6.69	1,431.71	1,431.71	N/A	N/A
MH-264	1,438.30	1,432.49	0.00	5.81	1,432.49	N/A	N/A	N/A
MH-265	1,438.00	1,428.74	0.10	9.26	1,428.74	1,428.84	1,428.84	N/A
MH-266	1,438.10	1,430.20	0.00	7.90	1,430.20	1,430.20	N/A	N/A
MH-267	1,438.30	1,431.56	0.00	6.74	1,431.56	N/A	N/A	N/A
MH-268	1,437.90	1,429.76	0.10	8.14	1,429.76	1,429.86	N/A	N/A
MH-269	1,438.10	1,431.30	0.00	6.80	1,431.30	1,431.30	N/A	N/A
MH-270	1,438.40	1,432.73	0.00	5.67	1,432.73	N/A	N/A	N/A
MH-271	1,445.20	1,433.71	0.10	11.49	1,433.71	1,433.81	1,433.81	N/A
MH-272	1,445.20	1,435.34	0.00	9.86	1,435.34	1,435.34	N/A	N/A
MH-273	1,445.50	1,436.86	0.10	8.64	1,436.86	1,436.96	N/A	N/A
MH-274	1,445.70	1,437.92	0.00	7.78	1,437.92	1,437.92	N/A	N/A
MH-275	1,449.70	1,438.80	0.00	10.90	1,438.80	N/A	N/A	N/A
MH-276	1,445.20	1,434.76	0.10	10.44	1,434.76	1,434.86	1,434.86	N/A
MH-277	1,445.30	1,436.32	0.00	8.98	1,436.32	1,436.32	N/A	N/A
MH-278	1,445.60	1,437.77	0.00	7.83	1,437.77	N/A	N/A	N/A
MH-279	1,449.40	1,435.82	0.10	13.58	1,435.82	1,435.92	N/A	N/A
MH-280	1,449.70	1,437.45	0.10	12.25	1,437.45	1,437.55	1,437.55	N/A
MH-281	1,449.70	1,439.00	0.00	10.70	1,439.00	N/A	N/A	N/A
MH-282	1,449.60	1,438.13	0.10	11.47	1,438.13	1,438.23	1,438.23	N/A
MH-283	1,449.70	1,439.32	0.10	10.38	1,439.32	1,439.42	1,439.42	N/A
MH-284	1,449.70	1,440.14	0.00	9.56	1,440.14	N/A	N/A	N/A
MH-285	1,449.70	1,439.92	0.10	9.78	1,439.92	1,440.02	N/A	N/A
MH-286	1,453.00	1,441.36	0.00	11.64	1,441.36	N/A	N/A	N/A
MH-287	1,449.50	1,436.81	0.10	12.69	1,436.81	1,436.91	N/A	N/A
MH-288	1,452.60	1,437.93	0.10	14.67	1,437.93	1,438.03	N/A	N/A
MH-289	1,452.70	1,438.59	0.10	14.11	1,438.59	1,438.69	N/A	N/A
MH-290	1,452.70	1,439.62	0.00	13.08	1,439.62	N/A	N/A	N/A
MH-291	1,452.70	1,439.61	0.10	13.09	1,439.61	1,439.71	1,439.71	N/A
MH-292	1,452.70	1,439.91	0.10	12.79	1,439.91	1,440.01	N/A	N/A
MH-293	1,452.70	1,440.18	0.10	12.52	1,440.18	1,440.28	N/A	N/A
MH-294	1,452.70	1,441.24	0.00	11.46	1,441.24	N/A	N/A	N/A
MH-295	1,452.90	1,440.80	0.10	12.10	1,440.80	1;440.90	N/A	N/A
MH-296	1,453.00	1,441.10	0.10	11.90	1,441.10	1,441.20	1,441.20	N/A
MH-297	1,452.90	1,441.73	0.00	11.17	1,441.73	N/A	N/A	N/A
MH-298	1,453.00	1,441.70	0.10	11.30	1,441.70	1,441.80	N/A	N/A
MH-299	1,452.90	1,442.72	0.00	10.18	1,442.72	N/A	N/A	N/A
MH-300	1,456.10	1,439.51	0.10	16.59	1,439.51	1,439.61	1,439.61	N/A
MH-301	1,456.20	1,440.83	0.00	15.37	1,440.83	1,440.83	N/A	N/A
MH-302	1,456.30	1,442.05	0.10	14.25	1,442.05	1,442.15	N/A	N/A
MH-303	1,456.40	1,443.05	0.00	13.35	1,443.05	1,443.05	N/A	N/A
MH-304	1,459.00	1,443.83	0.00	15.17	1,443.83	N/A	N/A	N/A
MH-305	1,456.00	1,440.50	0.10	15.50	1,440.50	1,440.60	1,440.60	N/A
MH-306	1,456.30	1,441.82	0.00	14.48	1,441.82	1,441.82	N/A	N/A
MH-307	1,456.30	1,442.89	0.00	13.41	1,442.89	N/A	N/A	N/A
MH-308	1,458.70	1,441.49	0.10	17.21	1,441.49	1,441.59	N/A	N/A
MH-309	1,458.80	1,442.82	0.00	15.98	1,442.82	1,442.82	N/A	N/A
MH-310	1,459.00	1,444.04	0.00	14.96	1,444.04	N/A	N/A	N/A
MH-311	1,452.60	1,437.63	0.10	14.97	1,437.63	1,437.73	N/A	N/A
MH-312	1,451.40	1,438.26	0.10	13.14	1,438.26	1,438.36	1,438.36	N/A

Scenario: Base

Manhole Report

Label	Ground Elevation (ft)	Sump Elevation (ft)	Matchline Offset (ft)	Structure Depth (ft)	Invert Out Elevation (ft)	Invert In Elevation 1 (ft)	Invert In Elevation 2 (ft)	Invert In Elevation 3 (ft)
MH-313	1,451.10	1,439.82	0.00	11.28	1,439.82	1,439.82	N/A	N/A
MH-314	1,451.10	1,441.47	0.10	9.63	1,441.47	1,441.57	N/A	N/A
MH-315	1,454.00	1,443.00	0.00	11.00	1,443.00	1,443.00	N/A	N/A
MH-316	1,457.10	1,444.44	0.10	12.66	1,444.44	1,444.54	N/A	N/A
MH-317	1,457.40	1,445.73	0.00	11.67	1,445.73	N/A	N/A	N/A
MH-318	1,451.30	1,438.52	0.10	12.78	1,438.52	1,438.62	N/A	N/A
MH-319	1,451.60	1,439.27	0.10	12.33	1,439.27	1,439.37	N/A	N/A
MH-320	1,451.80	1,439.53	0.10	12.27	1,439.53	1,439.63	N/A	N/A
MH-321	1,451.60	1,440.65	0.00	10.95	1,440.65	1,440.65	N/A	N/A
MH-322	1,451.50	1,441.64	0.10	9.86	1,441.64	1,441.74	1,441.74	N/A
MH-323	1,451.20	1,442.86	0.00	8.34	1,442.86	N/A	N/A	N/A
MH-324	1,454.20	1,442.70	0.10	11.50	1,442.70	1,442.80	1,442.80	N/A
MH-325	1,454.00	1,443.92	0.00	10.08	1,443.92	N/A	N/A	N/A
MH-326	1,454.20	1,443.96	0.10	10.24	1,443.96	1,444.06	N/A	N/A
MH-327	1,457.40	1,444.88	0.10	12.52	1,444.88	1,444.98	N/A	N/A
MH-328	1,457.40	1,445.14	0.10	12.26	1,445.14	1,445.24	N/A	N/A
MH-329	1,457.50	1,446.51	0.00	10.99	1,446.51	N/A	N/A	N/A
MH-330	1,431.50	1,422.60	0.10	8.90	1,422.60	1,422.70	1,422.70	1,422.70
MH-331	1,431.00	1,423.62	0.10	7.38	1,423.62	1,423.72	N/A	N/A
MH-332	1,431.00	1,425.33	0.00	5.67	1,425.33	N/A	N/A	N/A
MH-333	1,431.40	1,423.54	0.00	7.86	1,423.54	1,423.54	N/A	N/A
MH-334	1,431.30	1,424.38	0.10	6.92	1,424.38	1,424.48	1,424.48	N/A
MH-335	1,431.00	1,425.24	0.00	5.76	1,425.24	N/A	N/A	N/A
MH-336	1,431.40	1,423.62	0.10	7.78	1,423.62	1,423.72	1,423.72	N/A
MH-337	1,431.30	1,425.29	0.00	6.01	1,425.29	N/A	N/A	N/A
MH-338	1,433.90	1,424.65	0.10	9.25	1,424.65	1,424.75	N/A	N/A
MH-339	1,433.90	1,425.59	0.00	8.31	1,425.59	1,425.59	N/A	N/A
MH-340	1,433.80	1,426.43	0.00	7.37	1,426.43	N/A	N/A	N/A
MH-341	1,431.30	1,425.41	0.00	5.89	1,425.41	1,425.41	N/A	N/A
MH-342	1,433.70	1,426.20	0.00	7.50	1,426.20	N/A	N/A	N/A
MH-343	1,430.10	1,419.32	0.10	10.78	1,419.32	1,419.42	N/A	N/A
MH-344	1,430.10	1,419.81	0.10	10.29	1,419.81	1,419.91	N/A	N/A
MH-345	1,431.60	1,421.33	0.10	10.27	1,421.33	1,421.43	1,421.43	N/A
MH-346	1,431.40	1,422.32	0.00	9.08	1,422.32	1,422.32	N/A	N/A
MH-347	1,434.10	1,423.23	0.10	10.87	1,423.23	1,423.33	N/A	N/A
MH-348	1,431.40	1,417.31	0.10	14.09	1,417.31	1,417.41	1,417.41	N/A
MH-349	1,431.40	1,417.63	0.10	13.77	1,417.63	1,417.73	N/A	N/A
MH-350	1,431.40	1,418.05	0.10	13.35	1,418.05	1,418.15	N/A	N/A
MH-351	1,431.50	1,419.64	0.10	11.86	1,419.64	1,419.74	N/A	N/A
MH-352	1,431.60	1,420.92	0.10	10.68	1,420.92	1,421.02	N/A	N/A
MH-353	1,434.20	1,422.34	0.00	11.86	1,422.34	N/A	N/A	N/A
MH-354	1,431.30	1,419.01	0.10	12.29	1,419.01	1,419.11	N/A	N/A
MH-355	1,431.70	1,419.60	0.10	12.10	1,419.60	1,419.70	N/A	N/A
MH-356	1,433.80	1,420.20	0.10	13.60	1,420.20	1,420.30	N/A	N/A
MH-357	1,433.70	1,420.79	0.10	12.91	1,420.79	1,420.89	N/A	N/A
MH-358	1,433.60	1,421.39	0.10	12.21	1,421.39	1,421.49	N/A	N/A
MH-359	1,434.10	1,421.98	0.10	12.12	1,421.98	1,422.08	N/A	N/A
MH-360	1,434.10	1,422.58	0.00	11.52	1,422.58	N/A	N/A	N/A
MH-361	1,434.00	1,424.68	0.10	9.32	1,424.68	1,424.78	N/A	N/A
MH-362	1,439.20	1,425.39	0.10	13.81	1,425.39	1,425.49	1,425.49	N/A
MH-363	1,439.10	1,426.90	0.10	12.20	1,426.90	1,427.00	1,427.00	N/A
MH-364	1,438.80	1,428.39	0.00	10.41	1,428.39	N/A	N/A	N/A

Scenario: Base

Manhole Report

Label	Ground Elevation (ft)	Sump Elevation (ft)	Matchline Offset (ft)	Structure Depth (ft)	Invert Out Elevation (ft)	Invert In Elevation 1 (ft)	Invert In Elevation 2 (ft)	Invert In Elevation 3 (ft)
MH-365	1,439.40	1,427.96	0.10	11.44	1,427.96	1,428.06	N/A	N/A
MH-366	1,439.40	1,429.65	0.00	9.75	1,429.65	N/A	N/A	N/A
MH-367	1,436.60	1,426.33	0.00	10.27	1,426.33	1,426.33	N/A	N/A
MH-368	1,436.50	1,427.18	0.10	9.32	1,427.18	1,427.28	1,427.28	N/A
MH-369	1,435.50	1,428.30	0.00	7.20	1,428.30	N/A	N/A	N/A
MH-370	1,441.90	1,428.23	0.10	13.67	1,428.23	1,428.33	1,428.33	N/A
MH-371	1,439.50	1,429.71	0.00	9.79	1,429.71	N/A	N/A	N/A
MH-372	1,441.60	1,429.29	0.10	12.31	1,429.29	1,429.39	N/A	N/A
MH-373	1,441.20	1,431.04	0.00	10.16	1,431.04	N/A	N/A	N/A
MH-374	1,433.90	1,420.85	0.10	13.05	1,420.85	1,420.95	N/A	N/A
MH-375	1,433.90	1,421.24	0.10	12.66	1,421.24	1,421.34	N/A	N/A
MH-376	1,433.90	1,421.62	0.10	12.28	1,421.62	1,421.72	N/A	N/A
MH-377	1,436.80	1,422.18	0.10	14.62	1,422.18	1,422.28	1,422.28	N/A
MH-378	1,436.80	1,423.04	0.10	13.76	1,423.04	1,423.14	1,423.14	N/A
MH-379	1,433.90	1,424.05	0.10	9.85	1,424.05	1,424.15	N/A	N/A
MH-380	1,434.10	1,425.10	0.00	9.00	1,425.10	N/A	N/A	N/A
MH-381	1,437.00	1,424.21	0.10	12.79	1,424.21	1,424.31	1,424.31	N/A
MH-382	1,434.10	1,425.22	0.00	8.88	1,425.22	N/A	N/A	N/A
MH-383	1,437.00	1,425.63	0.00	11.37	1,425.63	1,425.63	N/A	N/A
MH-384	1,441.90	1,426.92	0.00	14.98	1,426.92	N/A	N/A	N/A
MH-385	1,436.60	1,423.19	0.10	13.41	1,423.19	1,423.29	1,423.29	N/A
MH-386	1,436.80	1,424.94	0.00	11.86	1,424.94	N/A	N/A	N/A
MH-387	1,441.90	1,424.20	0.10	17.70	1,424.20	1,424.30	1,424.30	N/A
MH-388	1,442.00	1,425.95	0.00	16.05	1,425.95	N/A	N/A	N/A
MH-389	1,441.70	1,425.21	0.10	16.49	1,425.21	1,425.31	N/A	N/A
MH-390	1,441.90	1,426.24	0.00	15.66	1,426.24	1,426.24	N/A	N/A
MH-391	1,441.90	1,427.14	0.00	14.76	1,427.14	N/A	N/A	N/A
MH-392	1,431.80	1,419.51	0.10	12.29	1,419.51	1,419.61	N/A	N/A
MH-393	1,432.20	1,420.24	0.10	11.96	1,420.24	1,420.34	N/A	N/A
MH-394	1,434.70	1,421.99	0.10	12.71	1,421.99	1,422.09	1,422.09	N/A
MH-395	1,434.80	1,423.44	0.00	11.36	1,423.44	1,423.44	N/A	N/A
MH-396	1,434.90	1,424.79	0.10	10.11	1,424.79	1,424.89	N/A	N/A
MH-397	1,434.80	1,425.61	0.00	9.19	1,425.61	N/A	N/A	N/A
MH-398	1,434.80	1,422.98	0.10	11.82	1,422.98	1,423.08	1,423.08	N/A
MH-399	1,434.90	1,424.40	0.00	10.50	1,424.40	1,424.40	N/A	N/A
MH-400	1,434.70	1,425.55	0.00	9.15	1,425.55	1,425.55	N/A	N/A
MH-401	1,435.00	1,426.71	0.10	8.29	1,426.71	1,426.81	N/A	N/A
MH-402	1,435.10	1,427.52	0.00	7.58	1,427.52	N/A	N/A	N/A
MH-403	1,434.90	1,423.97	0.10	10.93	1,423.97	1,424.07	N/A	N/A
MH-404	1,435.00	1,425.55	0.00	9.45	1,425.55	1,425.55	N/A	N/A
MH-405	1,434.90	1,427.04	0.00	7.86	1,427.04	1,427.04	N/A	N/A
MH-406	1,437.20	1,428.52	0.00	8.68	1,428.52	N/A	N/A	N/A
MH-407	1,431.50	1,415.93	0.10	15.57	1,415.93	1,416.03	1,416.03	N/A
MH-408	1,431.60	1,417.06	0.00	14.54	1,417.06	1,417.06	N/A	N/A
MH-409	1,431.60	1,418.06	0.00	13.54	1,418.06	N/A	N/A	N/A
MH-410	1,431.70	1,416.43	0.10	15.27	1,416.43	1,416.53	1,416.53	N/A
MH-411	1,431.70	1,417.63	0.00	14.07	1,417.63	1,417.63	N/A	N/A
MH-412	1,431.50	1,418.72	0.10	12.78	1,418.72	1,418.82	1,418.82	N/A
MH-413	1,431.50	1,418.98	0.00	12.52	1,418.98	N/A	N/A	N/A
MH-414	1,432.10	1,419.76	0.10	12.34	1,419.76	1,419.86	N/A	N/A
MH-415	1,432.50	1,420.19	0.10	12.31	1,420.19	1,420.29	N/A	N/A
MH-416	1,432.80	1,421.20	0.10	11.60	1,421.20	1,421.30	N/A	N/A

Scenario: Base

Manhole Report

Label	Ground Elevation (ft)	Sump Elevation (ft)	Matchline Offset (ft)	Structure Depth (ft)	Invert Out Elevation (ft)	Invert In Elevation 1 (ft)	Invert In Elevation 2 (ft)	Invert In Elevation 3 (ft)
MH-417	1,432.80	1,421.63	0.10	11.17	1,421.63	1,421.73	N/A	N/A
MH-418	1,432.90	1,422.64	0.00	10.26	1,422.64	N/A	N/A	N/A
MH-419	1,431.70	1,417.18	0.10	14.52	1,417.18	1,417.28	N/A	N/A
MH-420	1,432.40	1,418.12	0.00	14.28	1,418.12	1,418.12	N/A	N/A
MH-421	1,432.50	1,418.96	0.00	13.54	1,418.96	N/A	N/A	N/A
MH-422	1,432.90	1,416.29	0.00	16.61	1,416.29	1,416.29	N/A	N/A
MH-423	1,432.80	1,417.57	0.10	15.23	1,417.57	1,417.67	1,417.67	N/A
MH-424	1,432.90	1,418.29	0.10	14.61	1,418.29	1,418.39	N/A	N/A
MH-425	1,432.90	1,419.02	0.10	13.88	1,419.02	1,419.12	N/A	N/A
MH-426	1,432.90	1,419.46	0.10	13.44	1,419.46	1,419.56	N/A	N/A
MH-427	1,433.10	1,420.50	0.10	12.60	1,420.50	1,420.60	N/A	N/A
MH-428	1,435.90	1,422.25	0.00	13.65	1,422.25	1,422.25	N/A	N/A
MH-429	1,435.90	1,423.90	0.00	12.00	1,423.90	N/A	N/A	N/A
MH-430	1,432.70	1,417.89	0.10	14.81	1,417.89	1,417.99	N/A	N/A
MH-431	1,433.00	1,419.24	0.10	13.76	1,419.24	1,419.34	1,419.34	N/A
MH-432	1,433.10	1,419.52	0.10	13.58	1,419.52	1,419.62	N/A	N/A
MH-433	1,433.40	1,421.24	0.00	12.16	1,421.24	1,421.24	N/A	N/A
MH-434	1,435.30	1,422.85	0.00	12.45	1,422.85	1,422.85	N/A	N/A
MH-435	1,435.40	1,424.46	0.10	10.94	1,424.46	1,424.56	N/A	N/A
MH-436	1,435.20	1,425.45	0.00	9.75	1,425.45	N/A	N/A	N/A
MH-437	1,433.00	1,420.12	0.10	12.88	1,420.12	1,420.22	N/A	N/A
MH-438	1,433.20	1,421.34	0.10	11.86	1,421.34	1,421.44	1,421.44	N/A
MH-439	1,435.00	1,422.66	0.00	12.34	1,422.66	1,422.66	N/A	N/A
MH-440	1,435.20	1,423.88	0.00	11.32	1,423.88	1,423.88	N/A	N/A
MH-441	1,435.20	1,425.11	0.00	10.09	1,425.11	N/A	N/A	N/A
MH-442	1,434.80	1,422.43	0.10	12.37	1,422.43	1,422.53	N/A	N/A
MH-443	1,437.10	1,423.51	0.10	13.59	1,423.51	1,423.61	1,423.61	N/A
MH-444	1,437.20	1,425.21	0.00	11.99	1,425.21	1,425.21	N/A	N/A
MH-445	1,437.40	1,426.81	0.10	10.59	1,426.81	1,426.91	N/A	N/A
MH-446	1,437.50	1,427.83	0.00	9.67	1,427.83	1,427.83	N/A	N/A
MH-447	1,437.30	1,428.74	0.00	8.56	1,428.74	N/A	N/A	N/A
MH-448	1,437.50	1,424.63	0.10	12.87	1,424.63	1,424.73	N/A	N/A
MH-449	1,437.20	1,425.80	0.10	11.40	1,425.80	1,425.90	1,425.90	N/A
MH-450	1,437.30	1,426.89	0.00	10.41	1,426.89	1,426.89	N/A	N/A
MH-451	1,437.50	1,427.88	0.00	9.62	1,427.88	N/A	N/A	N/A
MH-452	1,437.30	1,426.93	0.10	10.37	1,426.93	1,427.03	N/A	N/A
MH-453	1,437.40	1,428.27	0.00	9.13	1,428.27	1,428.27	N/A	N/A
MH-454	1,437.50	1,429.51	0.00	7.99	1,429.51	N/A	N/A	N/A

Scenario: Base

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Bend Angle (degrees)	Length (ft)	Section Size
P-1	MH-79	1,422.64	MH-76	1,421.28	0.003300	0.00	410.28	8 inch
P-2	MH-67	1,422.64	MH-66	1,421.55	0.003300	90.00	330.00	8 inch
P-3	MH-74	1,423.36	MH-71	1,422.64	0.003300	90.00	221.00	8 inch
P-4	MH-75	1,420.46	MH-64	1,420.01	0.003300	90.00	135.00	8 inch
P-5	MH-68	1,423.79	MH-67	1,422.74	0.003300	90.00	320.00	8 inch
P-6	MH-71	1,422.54	MH-70	1,421.55	0.003300	0.00	300.00	8 inch
P-7	MH-70	1,421.55	MH-65	1,420.56	0.003300	90.00	300.00	8 inch
P-8	MH-69	1,423.48	MH-67	1,422.74	0.003300	0.00	226.00	8 inch
P-9	MH-73	1,424.83	MH-72	1,423.53	0.003300	0.00	396.00	8 inch
P-10	MH-72	1,423.53	MH-71	1,422.64	0.003300	90.00	270.00	8 inch
P-11	MH-76	1,421.18	MH-75	1,420.56	0.003300	90.00	189.72	8 inch
P-12	MH-78	1,422.39	MH-77	1,422.04	0.003300	1.12	105.92	8 inch
P-13	MH-64	1,419.91	MH-95	1,418.76	0.003300	89.60	348.50	8 inch
P-14	MH-65	1,420.46	MH-64	1,420.01	0.003300	90.00	135.00	8 inch
P-15	MH-66	1,421.45	MH-65	1,420.56	0.003300	0.00	270.00	8 inch
P-16	MH-104	1,420.76	MH-103	1,419.56	0.003300	25.00	362.18	8 inch
P-17	MH-100	1,419.13	MH-95	1,418.76	0.003300	0.40	113.00	8 inch
P-18	MH-103	1,419.46	MH-100	1,419.23	0.003300	1.86	70.14	8 inch
P-19	MH-102	1,421.23	MH-101	1,419.58	0.003300	13.58	500.00	8 inch
P-20	MH-101	1,419.48	MH-100	1,419.23	0.003300	59.48	73.48	8 inch
P-21	MH-96	1,419.03	MH-95	1,418.76	0.003300	85.06	82.82	8 inch
P-22	MH-97	1,420.20	MH-96	1,419.13	0.003300	37.54	322.94	8 inch
P-23	MH-98	1,421.58	MH-97	1,420.30	0.003300	1.88	386.70	8 inch
P-24	MH-89	1,416.73	MH-87	1,415.42	0.003300	89.55	395.50	8 inch
P-25	MH-88	1,416.40	MH-87	1,415.42	0.003300	90.45	295.50	8 inch
P-26	MH-94	1,417.60	MH-93	1,417.39	0.003300	46.71	62.37	8 inch
P-27	MH-93	1,417.29	MH-89	1,416.83	0.003300	2.03	140.05	8 inch
P-28	MH-85	1,414.07	MH-80	1,413.05	0.003300	90.32	309.85	8 inch
P-29	MH-86	1,414.50	MH-85	1,414.17	0.003300	22.13	99.17	8 inch
P-30	MH-87	1,415.32	MH-86	1,414.60	0.003300	22.00	219.32	8 inch
P-31	MH-90	1,417.08	MH-89	1,416.83	0.003300	94.62	75.94	8 inch
P-32	MH-91	1,417.44	MH-90	1,417.18	0.003300	37.29	80.00	8 inch
P-33	MH-92	1,418.99	MH-91	1,417.54	0.003300	4.13	438.40	8 inch
P-34	MH-81	1,413.12	MH-80	1,413.05	0.003300	90.00	21.00	8 inch
P-35	MH-83	1,413.79	MH-82	1,413.61	0.003300	40.93	54.28	8 inch
P-36	MH-84	1,414.47	MH-83	1,413.89	0.003300	41.00	175.20	8 inch
P-37	MH-82	1,413.51	MH-81	1,413.22	0.003300	95.84	87.97	8 inch
P-38	MH-99	1,421.97	MH-98	1,421.68	0.003300	40.70	89.99	8 inch
P-39	MH-107	1,419.01	MH-106	1,417.86	0.003300	0.00	350.00	8 inch
P-40	MH-109	1,421.31	MH-108	1,420.10	0.003300	90.00	366.76	8 inch
P-41	MH-108	1,420.00	MH-107	1,419.11	0.003300	90.00	270.00	8 inch
P-42	MH-111	1,417.37	MH-105	1,416.69	0.003300	90.00	205.50	8 inch
P-43	MH-106	1,417.86	MH-105	1,416.69	0.003300	90.00	354.18	8 inch
P-44	MH-110	1,420.81	MH-108	1,420.10	0.003300	90.00	214.00	8 inch
P-45	MH-118	1,420.03	MH-117	1,418.95	0.003300	0.00	329.24	8 inch
P-46	MH-116	1,417.79	MH-115	1,416.74	0.003300	90.00	319.44	8 inch
P-47	MH-114	1,415.65	MH-113	1,414.06	0.003300	18.39	480.00	8 inch
P-48	MH-113	1,413.96	MH-112	1,413.63	0.003300	16.84	100.00	8 inch
P-49	MH-119	1,416.74	MH-114	1,415.75	0.003300	89.56	300.50	8 inch
P-50	MH-117	1,418.95	MH-116	1,417.79	0.003300	0.00	350.00	8 inch
P-51	MH-129	1,415.80	MH-122	1,414.91	0.003300	64.97	270.00	8 inch

Scenario: Base

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Bend Angle (degrees)	Length (ft)	Section Size
P-52	MH-123	1,415.57	MH-122	1,414.91	0.003300	24.20	200.00	8 inch
P-53	MH-124	1,416.50	MH-123	1,415.67	0.003300	5.68	250.00	8 inch
P-54	MH-127	1,419.74	MH-126	1,418.85	0.003300	0.00	270.00	8 inch
P-55	MH-128	1,418.23	MH-125	1,417.86	0.003300	90.13	112.66	8 inch
P-56	MH-133	1,416.79	MH-129	1,415.90	0.003300	0.00	270.00	8 inch
P-57	MH-130	1,416.56	MH-129	1,415.90	0.003300	88.88	200.00	8 inch
P-58	MH-131	1,417.49	MH-130	1,416.66	0.003300	5.19	250.00	8 inch
P-59	MH-132	1,418.60	MH-131	1,417.59	0.003300	9.24	306.64	8 inch
P-60	MH-126	1,418.75	MH-125	1,417.86	0.003300	92.52	270.00	8 inch
P-61	MH-134	1,417.55	MH-133	1,416.89	0.003300	88.29	200.00	8 inch
P-62	MH-135	1,418.48	MH-134	1,417.65	0.003300	4.13	250.00	8 inch
P-63	MH-136	1,419.65	MH-135	1,418.58	0.003300	8.64	323.51	8 inch
P-64	MH-125	1,417.76	MH-124	1,416.60	0.003300	9.03	352.66	8 inch
P-65	MH-140	1,421.01	MH-139	1,420.10	0.003300	86.42	276.18	8 inch
P-66	MH-148	1,423.43	MH-146	1,422.54	0.003300	92.51	270.00	8 inch
P-67	MH-137	1,419.06	MH-126	1,418.85	0.003300	94.22	62.26	8 inch
P-68	MH-138	1,419.65	MH-137	1,419.16	0.003300	14.99	150.00	8 inch
P-69	MH-139	1,420.00	MH-138	1,419.75	0.003300	15.62	76.41	8 inch
P-70	MH-141	1,421.54	MH-140	1,421.11	0.003300	86.55	130.00	8 inch
P-71	MH-142	1,422.73	MH-141	1,421.64	0.003300	8.08	330.00	8 inch
P-72	MH-143	1,423.36	MH-142	1,422.83	0.003300	8.22	160.23	8 inch
P-73	MH-144	1,420.53	MH-139	1,420.10	0.003300	0.13	130.00	8 inch
P-74	MH-146	1,422.44	MH-145	1,421.95	0.003300	9.18	148.05	8 inch
-75	MH-145	1,421.85	MH-144	1,420.63	0.003300	8.24	370.00	8 inch
-76	MH-150	1,421.54	MH-149	1,421.11	0.003300	93.45	130.00	8 inch
P-77	MH-152	1,423.29	MH-151	1,423.00	0.003300	6.88	88.96	8 inch
P-78	MH-151	1,422.90	MH-150	1,421.64	0.003300	8.63	380.00	8 inch
P-79	MH-147	1,423.43	MH-146	1,422.54	0.003300	87.49	270.00	8 inch
P-80	MH-149	1,421.01	MH-139	1,420.10	0.003300	93.58	276.18	8 inch
P-81	MH-153	1,421.80	MH-149	1,421.11	0.003300	0.00	208.86	8 inch
P-82	MH-158	1,422.37	MH-154	1,421.48	0.003300	28.12	270.00	8 inch
P-83	MH-166	1,424.46	MH-163	1,423.46	0.003300	0.00	303.50	8 inch
P-84	MH-163	1,423.36	MH-158	1,422.47	0.003300	0.00	270.00	8 inch
P-85	MH-60	1,422.29	MH-59	1,421.26	0.003300	0.00	310.12	8 inch
P-86	MH-54	1,420.22	MH-53	1,419.17	0.003300	90.00	320.00	8 inch
P-87	MH-56	1,422.29	MH-55	1,421.36	0.003300	90.00	279.51	8 inch
P-88	MH-57	1,422.18	MH-55	1,421.36	0.003300	90.00	247.38	8 inch
P-89	MH-58	1,420.12	MH-53	1,419.17	0.003300	0.00	290.00	8 inch
P-90	MH-53	1,419.07	MH-49	1,418.59	0.003300	90.00	145.00	8 inch
P-91	MH-62	1,418.59	MH-61	1,416.94	0.003300	90.00	500.00	8 inch
P-92	MH-61	1,416.84	MH-47	1,415.88	0.003300	52.12	290.00	8 inch
P-93	MH-49	1,418.49	MH-48	1,417.19	0.003300	0.00	395.00	8 inch
P-94	MH-59	1,421.26	MH-58	1,420.22	0.003300	90.00	315.00	8 inch
P-95	MH-55	1,421.26	MH-54	1,420.22	0.003300	0.00	315.00	8 inch
P-96	MH-50	1,419.05	MH-49	1,418.59	0.003300	91.23	138.29	8 inch
P-97	MH-51	1,419.85	MH-50	1,419.15	0.003300	89.41	212.08	8 inch
P-98	MH-63	1,419.48	MH-62	1,418.69	0.003300	0.00	241.00	8 inch
P-99	MH-48	1,417.19	MH-47	1,415.88	0.003300	37.88	395.00	8 inch
P-100	MH-340	1,426.43	MH-339	1,425.59	0.003300	0.00	255.00	8 inch
-101	MH-338	1,424.65	MH-336	1,423.72	0.003300	0.00	280.00	8 inch
-102	MH-337	1,425.29	MH-336	1,423.72	0.003300	90.00	476.00	8 inch

Scenario: Base

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Bend Angle (degrees)	Length (ft)	Section Size
P-103	MH-334	1,424.38	MH-333	1,423.54	0.003300	0.00	255.00	8 inch
P-104	MH-332	1,425.33	MH-331	1,423.72	0.003300	90.00	488.01	8 inch
P-105	MH-335	1,425.24	MH-334	1,424.48	0.003300	90.00	229.00	8 inch
P-106	MH-366	1,429.65	MH-365	1,428.06	0.003300	90.00	484.00	8 inch
P-107	MH-365	1,427.96	MH-363	1,427.00	0.003300	90.00	290.00	8 inch
P-108	MH-363	1,426.90	MH-362	1,425.49	0.003300	90.46	428.00	8 inch
P-109	MH-371	1,429.71	MH-370	1,428.33	0.003300	90.00	416.00	8 inch
P-110	MH-367	1,426.33	MH-362	1,425.49	0.003300	89.54	256.00	8 inch
P-111	MH-373	1,431.04	MH-372	1,429.39	0.003300	90.00	498.50	8 inch
P-112	MH-370	1,428.23	MH-368	1,427.28	0.003300	90.00	290.00	8 inch
P-113	MH-372	1,429.29	MH-370	1,428.33	0.003300	0.00	290.00	8 inch
P-114	MH-369	1,428.30	MH-368	1,427.28	0.003300	90.00	310.77	8 inch
P-115	MH-390	1,426.24	MH-389	1,425.31	0.003300	90.00	280.00	8 inch
P-116	MH-388	1,425.95	MH-387	1,424.30	0.003300	90.00	500.00	8 inch
P-117	MH-386	1,424.94	MH-385	1,423.29	0.003300	90.00	500.00	8 inch
P-118	MH-378	1,423.04	MH-377	1,422.28	0.003300	88.44	230.00	8 inch
P-119	MH-380	1,425.10	MH-379	1,424.15	0.003300	90.00	289.00	8 inch
P-120	MH-379	1,424.05	MH-378	1,423.14	0.003300	90.00	276.00	8 inch
P-121	MH-384	1,426.92	MH-383	1,425.63	0.003300	0.00	391.81	8 inch
P-122	MH-382	1,425.22	MH-381	1,424.31	0.003300	90.00	276.00	8 inch
P-123	MH-383	1,425.63	MH-381	1,424.31	0.003300	90.00	400.00	8 inch
P-124	MH-389	1,425.21	MH-387	1,424.30	0.003300	0.00	276.00	8 inch
P-125	MH-387	1,424.20	MH-385	1,423.29	0.003300	0.00	276.00	8 inch
P-126	MH-385	1,423.19	MH-377	1,422.28	0.003300	1.56	276.00	8 inch
P-127	MH-375	1,421.24	MH-374	1,420.95	0.003300	14.51	85.26	8 inch
P-128	MH-376	1,421.62	MH-375	1,421.34	0.003300	16.41	85.32	8 inch
P-129	MH-374	1,420.85	MH-43	1,420.39	0.003300	81.74	140.00	8 inch
P-130	MH-377	1,422.18	MH-376	1,421.72	0.003300	15.30	140.00	8 inch
P-131	MH-381	1,424.21	MH-378	1,423.14	0.003300	0.00	325.00	8 inch
P-132	MH-404	1,425.55	MH-403	1,424.07	0.003300	90.00	450.00	8 inch
P-133	MH-401	1,426.71	MH-400	1,425.55	0.003300	0.00	350.00	8 inch
P-134	MH-402	1,427.52	MH-401	1,426.81	0.003300	90.00	216.50	8 inch
P-135	MH-397	1,425.61	MH-396	1,424.89	0.003300	90.00	216.50	8 inch
P-136	MH-403	1,423.97	MH-398	1,423.08	0.003300	0.00	270.00	8 inch
P-137	MH-43	1,420.29	MH-42	1,419.67	0.003300	13.18	190.00	8 inch
P-138	MH-42	1,419.57	MH-41	1,418.95	0.003300	14.90	186.41	8 inch
P-139	MH-405	1,427.04	MH-404	1,425.55	0.003300	0.00	450.00	8 inch
P-140	MH-406	1,428.52	MH-405	1,427.04	0.003300	0.00	448.74	8 inch
P-141	MH-398	1,422.98	MH-394	1,422.09	0.003300	90.00	270.00	8 inch
P-142	MH-399	1,424.40	MH-398	1,423.08	0.003300	90.00	400.00	8 inch
P-143	MH-400	1,425.55	MH-399	1,424.40	0.003300	0.00	350.00	8 inch
P-144	MH-396	1,424.79	MH-395	1,423.44	0.003300	0.00	410.00	8 inch
P-145	MH-394	1,421.99	MH-393	1,420.34	0.003300	1.96	500.00	8 inch
P-146	MH-395	1,423.44	MH-394	1,422.09	0.003300	0.00	410.00	8 inch
P-147	MH-393	1,420.24	MH-392	1,419.61	0.003300	9.10	189.71	8 inch
P-148	MH-392	1,419.51	MH-41	1,418.95	0.003300	84.79	170.00	8 inch
P-149	MH-47	1,415.78	MH-46	1,415.31	0.003300	47.60	142.44	8 inch
P-150	MH-46	1,415.21	MH-37	1,414.77	0.003300	51.58	133.43	8 inch
P-151	MH-37	1,414.67	MH-36	1,414.40	0.002400	68.24	111.48	10 inch
P-152	MH-36	1,414.30	MH-35	1,414.04	0.002400	43.19	111.48	8 inch
P-153	MH-41	1,418.85	MH-40	1,418.02	0.003300	5.44	250.00	8 inch

Scenario: Base

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Bend Angle (degrees)	Length (ft)	Section Size
P-154	MH-38	1,415.28	MH-37	1,414.77	0.003300	42.04	154.95	8 inch
P-155	MH-39	1,416.67	MH-38	1,415.38	0.003300	5.96	389.87	8 inch
P-156	MH-339	1,425.59	MH-338	1,424.75	0.003300	90.00	255.00	8 inch
P-157	MH-336	1,423.62	MH-330	1,422.70	0.003300	90.00	280.00	8 inch
P-158	MH-341	1,425.41	MH-334	1,424.48	0.003300	90.00	280.00	8 inch
P-159	MH-342	1,426.20	MH-341	1,425.41	0.003300	0.00	241.61	8 inch
P-160	MH-391	1,427.14	MH-390	1,426.24	0.003300	0.00	275.00	8 inch
P-163	MH-33	1,413.01	MH-32	1,412.78	0.001900	4.96	122.55	12 inch
P-164	MH-32	1,412.68	MH-1	1,412.22	0.001900	86.44	240.16	12 inch
P-165	MH-2	1,412.76	MH-1	1,412.22	0.003300	85.74	162.82	8 inch
P-166	MH-3	1,413.22	MH-2	1,412.86	0.003300	7.15	110.86	8 inch
P-193	MH-154	1,421.38	MH-11	1,420.59	0.003300	62.45	239.16	8 inch
P-194	MH-4	1,413.92	MH-3	1,413.32	0.003300	7.58	180.00	8 inch
P-195	MH-5	1,414.61	MH-4	1,414.02	0.003300	9.39	180.00	8 inch
P-196	MH-6	1,415.30	MH-5	1,414.71	0.003300	9.39	180.00	8 inch
P-197	MH-7	1,416.00	MH-6	1,415.40	0.003300	9.39	180.00	8 inch
P-198	MH-8	1,417.75	MH-7	1,416.10	0.003300	8.10	500.00	8 inch
P-199	MH-11	1,420.49	MH-10	1,419.70	0.003300	4.12	240.00	8 inch
P-200	MH-9	1,418.67	MH-8	1,417.85	0.003300	1.37	250.00	8 inch
P-201	MH-10	1,419.60	MH-9	1,418.77	0.003300	4.67	250.00	8 inch
P-202	MH-438	1,421.34	MH-437	1,420.22	0.003300	90.00	340.63	8 inch
P-219	MH-442	1,422.43	MH-438	1,421.44	0.003300	90.00	300.00	8 inch
P-220	MH-439	1,422.66	MH-438	1,421.44	0.003300	0.00	370.00	8 inch
P-221	MH-440	1,423.88	MH-439	1,422.66	0.003300	0.00	370.00	8 inch
P-222	MH-441	1,425.11	MH-440	1,423.88	0.003300	0.00	371.71	8 inch
P-223	MH-443	1,423.51	MH-442	1,422.53	0.003300	90.00	296.64	8 inch
P-224	MH-449	1,425.80	MH-448	1,424.73	0.003300	90.00	325.00	8 inch
P-225	MH-453	1,428.27	MH-452	1,427.03	0.003300	90.00	375.00	8 inch
P-226	MH-452	1,426.93	MH-449	1,425.90	0.003300	90.00	310.00	8 inch
P-227	MH-446	1,427.83	MH-445	1,426.91	0.003300	90.00	280.00	8 inch
P-228	MH-448	1,424.63	MH-443	1,423.61	0.003300	90.00	310.00	8 inch
P-229	MH-450	1,426.89	MH-449	1,425.90	0.003300	0.00	300.00	8 inch
P-230	MH-451	1,427.88	MH-450	1,426.89	0.003300	0.00	299.00	8 inch
P-231	MH-444	1,425.21	MH-443	1,423.61	0.003300	0.00	485.00	8 inch
P-232	MH-445	1,426.81	MH-444	1,425.21	0.003300	0.00	485.00	8 inch
P-233	MH-447	1,428.74	MH-446	1,427.83	0.003300	0.00	274.00	8 inch
P-234	MH-454	1,429.51	MH-453	1,428.27	0.003300	0.00	376.79	8 inch
P-235	MH-219	1,423.97	MH-218	1,422.59	0.003300	90.00	420.00	8 inch
P-236	MH-216	1,425.74	MH-215	1,424.34	0.003300	0.00	425.00	8 inch
P-237	MH-212	1,420.37	MH-206	1,420.11	0.003300	90.33	79.16	8 inch
P-238	MH-213	1,421.43	MH-212	1,420.47	0.003300	90.00	290.00	8 inch
P-239	MH-211	1,423.17	MH-208	1,422.41	0.003300	90.00	229.00	8 inch
P-240	MH-217	1,426.74	MH-216	1,425.84	0.003300	90.00	272.94	8 inch
P-241	MH-206	1,420.01	Pump Station 2	1,419.72	0.001900	0.00	154.09	8 inch
P-242	MH-220	1,425.36	MH-219	1,423.97	0.003300	0.00	420.00	8 inch
P-243	MH-221	1,426.73	MH-220	1,425.36	0.003300	0.00	416.38	8 inch
P-244	MH-218	1,422.49	MH-213	1,421.53	0.003300	0.00	290.00	8 inch
P-245	MH-207	1,421.22	MH-206	1,420.11	0.002400	89.67	460.00	10 inch
P-246	MH-208	1,422.31	MH-207	1,421.22	0.002400	0.00	455.84	10 inch
P-247	MH-214	1,422.93	MH-213	1,421.53	0.003300	90.00	425.00	8 inch
P-248	MH-215	1,424.34	MH-214	1,422.93	0.003300	0.00	425.00	8 inch

Scenario: Base

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Bend Angle (degrees)	Length (ft)	Section Size
P-249	MH-247	1,429.57	MH-246	1,428.05	0.003300	90.00	460.00	8 inch
P-250	MH-244	1,428.53	MH-243	1,427.03	0.003300	90.00	457.50	8 inch
P-251	MH-246	1,427.95	MH-243	1,427.03	0.003300	0.00	280.00	8 inch
P-252	MH-242	1,430.85	MH-241	1,430.04	0.003300	0.00	243.45	8 inch
P-253	MH-269	1,431.30	MH-268	1,429.86	0.003300	90.00	435.00	8 inch
P-254	MH-265	1,428.74	MH-260	1,427.81	0.003300	75.75	280.00	8 inch
P-255	MH-264	1,432.49	MH-263	1,431.71	0.003300	0.00	236.09	8 inch
P-256	MH-266	1,430.20	MH-265	1,428.84	0.003300	90.00	412.00	8 inch
P-257	MH-262	1,430.69	MH-261	1,429.25	0.003300	0.00	435.00	8 inch
P-258	MH-155	1,422.95	MH-154	1,421.48	0.003300	61.88	445.00	8 inch
P-259	MH-164	1,424.48	MH-163	1,423.46	0.003300	90.00	310.00	8 inch
P-260	MH-162	1,425.41	MH-160	1,424.62	0.003300	90.00	241.00	8 inch
P-261	MH-156	1,424.42	MH-155	1,422.95	0.003300	0.00	445.65	8 inch
P-262	MH-165	1,425.33	MH-164	1,424.48	0.003300	0.00	256.50	8 inch
P-263	MH-199	1,427.47	MH-191	1,426.53	0.003300	89.90	283.03	8 inch
P-264	MH-205	1,431.76	MH-204	1,431.37	0.003300	84.04	115.84	8 inch
P-265	MH-191	1,426.43	MH-161	1,425.51	0.003300	0.10	280.00	8 inch
P-266	MH-347	1,423.23	MH-346	1,422.32	0.003300	0.00	274.18	8 inch
P-267	MH-330	1,422.60	MH-345	1,421.43	0.003300	90.00	354.00	8 inch
P-268	MH-354	1,419.01	MH-348	1,417.41	0.003300	90.01	485.31	8 inch
P-269	MH-353	1,422.34	MH-352	1,421.02	0.003300	90.00	401.40	8 inch
P-270	MH-348	1,417.31	MH-39	1,416.77	0.003300	89.86	162.49	8 inch
P-271	MH-44	1,423.87	MH-347	1,423.33	0.003300	14.73	163.86	8 inch
P-272	MH-344	1,419.81	MH-343	1,419.42	0.003300	33.62	119.18	8 inch
P-273	MH-352	1,420.92	MH-351	1,419.74	0.003300	89.57	357.17	8 inch
P-274	MH-45	1,424.24	MH-44	1,423.97	0.003300	90.95	83.00	8 inch
P-275	MH-345	1,421.33	MH-344	1,419.91	0.003300	33.63	431.00	8 inch
P-276	MH-346	1,422.32	MH-345	1,421.43	0.003300	0.00	270.00	8 inch
P-277	MH-333	1,423.54	MH-330	1,422.70	0.003300	0.00	255.00	8 inch
P-278	MH-361	1,424.68	MH-45	1,424.34	0.003300	88.11	104.04	8 inch
P-279	MH-362	1,425.39	MH-361	1,424.78	0.003300	10.96	182.43	8 inch
P-280	MH-368	1,427.18	MH-367	1,426.33	0.003300	0.00	256.00	8 inch
P-281	MH-360	1,422.58	MH-359	1,422.08	0.003300	14.31	150.00	8 inch
P-282	MH-359	1,421.98	MH-358	1,421.49	0.003300	14.31	150.00	8 inch
P-283	MH-358	1,421.39	MH-357	1,420.89	0.003300	14.31	150.00	8 inch
P-284	MH-357	1,420.79	MH-356	1,420.30	0.003300	14.31	150.00	8 inch
P-285	MH-356	1,420.20	MH-355	1,419.70	0.003300	14.47	150.00	8 inch
P-286	MH-355	1,419.60	MH-354	1,419.11	0.003300	8.13	150.00	8 inch
P-287	MH-350	1,418.05	MH-349	1,417.73	0.003300	46.32	96.20	8 inch
P-288	MH-349	1,417.63	MH-348	1,417.41	0.003300	3.68	67.73	8 inch
P-289	MH-351	1,419.64	MH-350	1,418.15	0.003300	39.57	452.85	8 inch
P-290	MH-409	1,418.06	MH-408	1,417.06	0.003300	0.00	303.32	8 inch
P-291	MH-412	1,418.72	MH-411	1,417.63	0.003300	0.00	327.38	8 inch
P-292	MH-410	1,416.43	MH-407	1,416.03	0.003300	0.74	120.00	8 inch
P-293	MH-407	1,415.93	MH-38	1,415.38	0.003300	95.36	166.82	8 inch
P-294	MH-420	1,418.12	MH-419	1,417.28	0.003300	42.12	255.00	8 inch
P-295	MH-415	1,420.19	MH-414	1,419.86	0.003300	11.54	100.00	8 inch
P-296	MH-417	1,421.63	MH-416	1,421.30	0.003300	11.54	100.00	8 inch
P-297	MH-408	1,417.06	MH-407	1,416.03	0.003300	89.23	310.00	8 inch
P-298	MH-419	1,417.18	MH-410	1,416.53	0.003300	0.00	196.29	8 inch
P-299	MH-411	1,417.63	MH-410	1,416.53	0.003300	89.97	335.00	8 inch

Scenario: Base

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Bend Angle (degrees)	Length (ft)	Section Size
P-300	MH-421	1,418.96	MH-420	1,418.12	0.003300	0.00	255.00	8 inch
P-301	MH-122	1,414.81	MH-121	1,414.71	0.003300	23.80	30.00	8 inch
P-302	MH-121	1,414.61	MH-120	1,414.27	0.003300	55.32	103.95	8 inch
P-303	MH-120	1,414.17	MH-3	1,413.32	0.003300	71.02	256.37	8 inch
P-304	MH-258	1,432.06	MH-257	1,430.71	0.003300	90.00	410.00	8 inch
P-305	MH-254	1,429.59	MH-249	1,428.66	0.003300	81.97	280.00	8 inch
P-306	MH-253	1,433.40	MH-252	1,432.48	0.003300	0.00	280.00	8 inch
P-307	MH-256	1,432.27	MH-255	1,430.98	0.003300	0.00	392.00	8 inch
P-308	MH-251	1,431.45	MH-250	1,430.07	0.003300	0.00	420.19	8 inch
P-309	MH-28	1,423.08	MH-218	1,422.59	0.003300	45.47	150.00	8 inch
P-310	MH-241	1,430.04	MH-240	1,429.12	0.003300	90.00	280.00	8 inch
P-311	MH-245	1,429.89	MH-244	1,428.53	0.003300	0.00	411.50	8 inch
P-312	MH-243	1,426.93	MH-238	1,426.00	0.003300	92.23	280.00	8 inch
P-313	MH-248	1,431.07	MH-247	1,429.57	0.003300	0.00	455.00	8 inch
P-314	MH-260	1,427.71	MH-31	1,426.92	0.003300	65.53	240.00	8 inch
P-315	MH-236	1,425.09	MH-29	1,424.41	0.003300	84.44	205.19	8 inch
P-316	MH-237	1,425.52	MH-236	1,425.19	0.003300	11.52	99.87	8 inch
P-317	MH-238	1,425.90	MH-237	1,425.62	0.003300	10.21	85.26	8 inch
P-318	MH-29	1,424.31	MH-28	1,423.18	0.003300	74.99	342.42	8 inch
P-319	MH-30	1,425.57	MH-29	1,424.41	0.003300	9.36	349.87	8 inch
P-320	MH-31	1,426.82	MH-30	1,425.67	0.003300	9.94	349.87	8 inch
P-321	MH-270	1,432.73	MH-269	1,431.30	0.003300	0.00	435.00	8 inch
P-322	MH-261	1,429.25	MH-260	1,427.81	0.003300	14.25	435.00	8 inch
P-323	MH-267	1,431.56	MH-266	1,430.20	0.003300	0.00	412.00	8 inch
P-324	MH-263	1,431.71	MH-262	1,430.79	0.003300	90.00	280.00	8 inch
P-325	MH-268	1,429.76	MH-265	1,428.84	0.003300	0.00	280.00	8 inch
P-326	MH-232	1,427.97	MH-18	1,426.85	0.003300	90.01	339.65	8 inch
P-327	MH-235	1,430.47	MH-234	1,429.63	0.003300	16.70	252.67	8 inch
P-328	MH-234	1,429.53	MH-233	1,429.19	0.003300	16.70	104.39	8 inch
P-329	MH-223	1,426.80	MH-222	1,426.30	0.003300	12.51	151.28	8 inch
P-330	MH-222	1,426.20	MH-16	1,425.71	0.003300	83.66	147.00	8 inch
P-331	MH-231	1,431.19	MH-229	1,430.43	0.003300	90.00	230.00	8 inch
P-332	MH-228	1,430.30	MH-227	1,429.87	0.003300	0.00	130.00	8 inch
P-333	MH-229	1,430.33	MH-227	1,429.87	0.003300	90.00	140.00	8 inch
P-334	MH-224	1,427.46	MH-223	1,426.90	0.003300	90.00	170.00	8 inch
P-335	MH-209	1,422.70	MH-208	1,422.41	0.002400	87.35	121.15	10 inch
P-336	MH-210	1,423.02	MH-209	1,422.80	0.002400	17.44	91.32	8 inch
P-337	MH-225	1,428.00	MH-223	1,426.90	0.003300	0.00	335.00	8 inch
P-338	MH-226	1,429.11	MH-225	1,428.00	0.003300	0.00	335.00	8 inch
P-339	MH-227	1,429.77	MH-226	1,429.21	0.003300	90.00	169.99	8 inch
P-340	MH-230	1,431.22	MH-229	1,430.43	0.003300	90.00	240.00	8 inch
P-341	MH-233	1,429.09	MH-232	1,427.97	0.003300	0.00	339.65	8 inch
P-342	MH-13	1,423.82	MH-12	1,423.34	0.002400	90.00	199.22	10 inch
P-343	MH-14	1,424.41	MH-13	1,423.92	0.002400	12.05	205.00	10 inch
P-344	MH-15	1,425.00	MH-14	1,424.51	0.002400	12.22	205.00	10 inch
P-345	MH-16	1,425.61	MH-15	1,425.10	0.002400	12.45	212.55	10 inch
P-346	MH-17	1,426.22	MH-16	1,425.71	0.002400	12.60	210.03	10 inch
P-347	MH-252	1,432.48	MH-251	1,431.55	0.003300	90.00	280.00	8 inch
P-348	MH-257	1,430.61	MH-254	1,429.69	0.003300	0.00	280.00	8 inch
P-349	MH-259	1,433.39	MH-258	1,432.06	0.003300	0.00	401.38	8 inch
P-350	MH-255	1,430.98	MH-254	1,429.69	0.003300	90.00	392.00	8 inch

Scenario: Base

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Bend Angle (degrees)	Length (ft)	Section Size
P-351	MH-250	1,430.07	MH-249	1,428.66	0.003300	8.03	425.00	8 inch
P-352	MH-249	1,428.56	MH-19	1,427.84	0.003300	81.98	220.00	8 inch
P-353	MH-273	1,436.86	MH-272	1,435.34	0.003300	0.00	460.20	8 inch
P-354	MH-277	1,436.32	MH-276	1,434.86	0.003300	90.01	440.00	8 inch
P-355	MH-280	1,437.45	MH-279	1,435.92	0.003300	90.01	464.13	8 inch
P-356	MH-276	1,434.76	MH-271	1,433.81	0.003300	90.01	290.00	8 inch
P-357	MH-275	1,438.80	MH-274	1,437.92	0.003300	0.00	266.71	8 inch
P-358	MH-291	1,439.61	MH-282	1,438.23	0.003300	0.00	418.20	8 inch
P-359	MH-281	1,439.00	MH-280	1,437.55	0.003300	0.00	437.01	8 inch
P-360	MH-278	1,437.77	MH-277	1,436.32	0.003300	0.00	439.26	8 inch
P-361	MH-271	1,433.71	MH-23	1,432.95	0.003300	90.01	230.55	8 inch
P-362	MH-272	1,435.34	MH-271	1,433.81	0.003300	0.00	465.00	8 inch
P-363	MH-274	1,437.92	MH-273	1,436.96	0.003300	90.00	290.00	8 inch
P-364	MH-309	1,442.82	MH-308	1,441.59	0.003300	90.00	370.00	8 inch
P-365	MH-306	1,441.82	MH-305	1,440.60	0.003300	90.00	370.00	8 inch
P-366	MH-305	1,440.50	MH-300	1,439.61	0.003300	67.40	270.00	8 inch
P-367	MH-304	1,443.83	MH-303	1,443.05	0.003300	0.00	237.85	8 inch
P-368	MH-302	1,442.05	MH-301	1,440.83	0.003300	0.00	370.00	8 inch
P-369	MH-308	1,441.49	MH-305	1,440.60	0.003300	0.00	270.00	8 inch
P-370	MH-303	1,443.05	MH-302	1,442.15	0.003300	90.00	270.00	8 inch
P-371	MH-310	1,444.04	MH-309	1,442.82	0.003300	0.00	370.00	8 inch
P-372	MH-301	1,440.83	MH-300	1,439.61	0.003300	22.59	370.00	8 inch
P-373	MH-307	1,442.89	MH-306	1,441.82	0.003300	0.00	324.00	8 inch
-374	MH-300	1,439.51	MH-27	1,438.52	0.003300	54.90	300.00	8 inch
-375	MH-289	1,438.59	MH-288	1,438.03	0.003300	90.30	170.00	8 inch
P-376	MH-292	1,439.91	MH-291	1,439.71	0.003300	89.70	60.00	8 inch
P-377	MH-293	1,440.18	MH-292	1,440.01	0.003300	11.30	51.04	8 inch
P-378	MH-294	1,441.24	MH-293	1,440.28	0.003300	78.40	290.00	8 inch
P-379	MH-297	1,441.73	MH-296	1,441.20	0.003300	0.00	160.00	8 inch
P-380	MH-299	1,442.72	MH-298	1,441.80	0.003300	90.30	280.00	8 inch
P-381	MH-290	1,439.62	MH-289	1,438.69	0.003300	90.30	280.00	8 inch
P-382	MH-288	1,437.93	MH-287	1,436.91	0.003300	90.00	310.54	8 inch
P-383	MH-287	1,436.81	MH-25	1,435.97	0.003300	89.82	253.26	8 inch
P-384	MH-283	1,439.32	MH-282	1,438.23	0.003300	90.00	330.00	8 inch
P-385	MH-298	1,441.70	MH-296	1,441.20	0.003300	90.30	150.00	8 inch
P-386	MH-286	1,441.36	MH-285	1,440.02	0.003300	90.00	405.65	8 inch
P-387	MH-284	1,440.14	MH-283	1,439.42	0.003300	90.00	216.45	8 inch
P-388	MH-295	1,440.80	MH-291	1,439.71	0.003300	90.30	330.00	8 inch
P-389	MH-296	1,441.10	MH-295	1,440.90	0.003300	90.30	60.00	8 inch
P-390	MH-285	1,439.92	MH-283	1,439.42	0.003300	0.00	150.00	8 inch
P-391	MH-282	1,438.13	MH-280	1,437.55	0.003300	90.00	176.09	8 inch
P-392	MH-25	1,435.87	MH-24	1,434.43	0.003300	0.19	436.09	8 inch
P-393	MH-319	1,439.27	MH-318	1,438.62	0.003300	12.39	194.53	8 inch
P-394	MH-321	1,440.65	MH-320	1,439.63	0.003300	90.00	308.78	8 inch
P-395	MH-315	1,443.00	MH-314	1,441.57	0.003300	90.00	435.00	8 inch
P-396	MH-324	1,442.70	MH-322	1,441.74	0.003300	90.00	290.00	8 inch
P-397	MH-326	1,443.96	MH-324	1,442.80	0.003300	90.00	351.80	8 inch
P-398	MH-327	1,444.88	MH-326	1,444.06	0.003300	75.00	248.47	8 inch
P-399	MH-317	1,445.73	MH-316	1,444.54	0.003300	90.00	361.50	8 inch
-400	MH-318	1,438.52	MH-312	1,438.36	0.003300	90.00	50.00	8 inch
401	MH-312	1,438.26	MH-311	1,437.73	0.003300	12.39	160.00	8 inch

Scenario: Base

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Bend Angle (degrees)	Length (ft)	Section Size
P-402	MH-313	1,439.82	MH-312	1,438.36	0.003300	0.00	442.05	8 inch
P-403	MH-323	1,442.86	MH-322	1,441.74	0.003300	0.00	341.00	8 inch
P-404	MH-322	1,441.64	MH-321	1,440.65	0.003300	0.00	300.00	8 inch
P-405	MH-325	1,443.92	MH-324	1,442.80	0.003300	90.00	341.00	8 inch
P-406	MH-316	1,444.44	MH-315	1,443.00	0.003300	0.00	435.00	8 inch
P-407	MH-328	1,445.14	MH-327	1,444.98	0.003300	15.00	50.00	8 inch
P-408	MH-320	1,439.53	MH-319	1,439.37	0.003300	12.39	50.00	8 inch
P-409	MH-311	1,437.63	MH-26	1,437.47	0.003300	88.60	50.00	8 inch
P-410	MH-329	1,446.51	MH-328	1,445.24	0.003300	90.00	384.61	8 inch
P-411	MH-314	1,441.47	MH-313	1,439.82	0.003300	0.00	500.00	8 inch
P-412	MH-26	1,437.37	MH-25	1,435.97	0.003300	11.22	422.57	8 inch
P-413	MH-12	1,423.24	MH-210	1,423.12	0.002400	14.34	50.28	8 inch
P-414	MH-200	1,428.23	MH-199	1,427.57	0.003300	74.75	200.00	8 inch
P-415	MH-201	1,428.99	MH-200	1,428.33	0.003300	9.94	200.00	8 inch
P-416	MH-202	1,429.75	MH-201	1,429.09	0.003300	9.94	200.00	8 inch
P-417	MH-203	1,430.51	MH-202	1,429.85	0.003300	9.94	200.00	8 inch
P-418	MH-204	1,431.27	MH-203	1,430.61	0.003300	9.99	201.74	8 inch
P-419	MH-198	1,431.83	MH-197	1,431.42	0.003300	95.16	124.19	8 inch
P-420	MH-192	1,427.19	MH-191	1,426.53	0.003300	11.99	200.20	8 inch
P-421	MH-193	1,428.02	MH-192	1,427.29	0.003300	8.58	220.00	8 inch
P-422	MH-194	1,428.85	MH-193	1,428.12	0.003300	8.80	220.00	8 inch
P-423	MH-195	1,429.67	MH-194	1,428.95	0.003300	8.80	220.00	8 inch
P-424	MH-196	1,430.50	MH-195	1,429.77	0.003300	8.80	220.00	8 inch
-425	MH-197	1,431.32	MH-196	1,430.60	0.003300	8.80	220.00	8 inch
-426	MH-80	1,412.95	Pump Station 1A	1,412.23	0.003300	0.00	218.44	8 inch
P-427	MH-95	1,418.66	MH-94	1,417.70	0.003300	40.51	292.00	8 inch
P-428	MH-1	1,412.12	Pump Station 1E	1,411.94	0.001400	0.00	130.43	8 inch
P-429	MH-112	1,413.53	MH-2	1,412.86	0.003300	85.32	205.17	8 inch
P-430	MH-331	1,423.62	MH-330	1,422.70	0.003300	90.00	280.00	8 inch
P-431	MH-279	1,435.82	MH-276	1,434.86	0.003300	0.00	290.00	8 inch
P-432	MH-24	1,434.43	MH-23	1,432.95	0.003300	0.00	450.00	8 inch
P-433	MH-22	1,431.60	MH-21	1,430.35	0.003300	0.00	380.00	8 inch
P-434	MH-21	1,430.35	MH-20	1,429.09	0.003300	0.00	380.00	8 inch
P-435	MH-20	1,429.09	MH-19	1,427.84	0.003300	0.00	380.00	8 inch
P-436	MH-23	1,432.85	MH-22	1,431.60	0.003300	0.00	378.12	8 inch
P-437	MH-19	1,427.74	MH-18	1,426.85	0.002400	0.00	370.32	10 inch
P-438	MH-18	1,426.75	MH-17	1,426.32	0.002400	6.26	179.37	10 inch
P-439	MH-27	1,438.42	MH-26	1,437.47	0.003300	1.40	289.84	8 inch
P-440	MH-239	1,427.51	MH-238	1,426.00	0.003300	2.23	457.50	8 inch
P-441	MH-413	1,418.98	MH-412	1,418.82	0.003300	89.58	50.00	8 inch
P-442	MH-414	1,419.76	MH-412	1,418.82	0.003300	90.42	286.12	8 inch
P-443	MH-416	1,421.20	MH-415	1,420.29	0.003300	11.54	276.44	8 inch
P-444	MH-418	1,422.64	MH-417	1,421.73	0.003300	11.54	274.56	8 inch
P-445	MH-343	1,419.32	MH-62	1,418.69	0.003300	90.00	189.73	8 inch
P-446	MH-160	1,424.52	MH-159	1,423.49	0.003300	0.00	310.00	8 inch
P-447	MH-161	1,425.51	MH-160	1,424.62	0.003300	0.00	270.66	8 inch
P-448	MH-159	1,423.49	MH-158	1,422.47	0.003300	90.00	310.00	8 inch
P-449	MH-240	1,429.02	MH-239	1,427.51	0.003300	0.00	457.50	8 inch
P-450	MH-364	1,428.39	MH-363	1,427.00	0.003300	0.00	422.60	8 inch
P-451	MH-52	1,421.27	MH-51	1,419.95	0.003300	1.82	400.00	8 inch
452	MH-40	1,417.92	MH-39	1,416.77	0.003300	0.18	350.13	8 inch

Scenario: Base

Outlet Report

Label	Ground Elevation (ft)	Sump Elevation (ft)	Structure Depth (ft)
Pump Station 1A	1,430.70	1,412.23	18.47
Pump Station 1B	1,431.00	1,411.94	19.06
Pump Station 2	1,436.10	1,419.72	16.38

Appendix B —

Sewer Pipe Sizing Calculations

see figure 3 for POINT locations

POINT "A"	Peaking Factor= 2.13		Demand Factor= 0.370				
PARCEL DESIGNATION	DWELLING UNITS	AREA (ac)	WET WEATHER IN. (gpm)	SEWER FLOW (gpm)	TOTAL FLOW (gpm)	PIPE SIZE (inch.)	FIGURE 3 MANHOLE NO.
3_1	119	20.0	3.47	44.01	47.47	8	
3_2	150	23.5	4.08	55.47	59.55		
3_3	150	23.5	4.08	55.47	59.55		
3_4	150	25.9	4.49	55.47	59.96		
3_5	196	27.0	4.69	72.48	77.16		
3_6	136	22.4	3.89	50.29	54.18		
3_10 (Park)	-	3.7	0.64	7.71	8.35		
1_1	128	27.5	4.78	47.33	52.11	10	
TOTAL DU'S=	1029			TOTAL SYSTEM FLOW=	418.34		
TOTAL POP.=	2573						

POINT "B"	Peaking Factor= 2.05		Demand Factor= 0.356				
PARCEL DESIGNATION	DWELLING UNITS	AREA (ac)	WET WEATHER IN. (gpm)	SEWER FLOW (gpm)	TOTAL FLOW (gpm)	PIPE SIZE (inch.)	FIGURE 3 MANHOLE NO.
Point "A"	1029	173.5	30.12	373.93	404.05	10	
3_7	157	32.5	5.65	55.88	61.53		
3_8	94	23.3	4.04	33.45	37.49		
1_8	132	33.3	5.77	46.98	52.75		
1_10 (Park)	-	5.1	0.88	10.54	11.42	12	
TOTAL DU'S=	1412			TOTAL SYSTEM FLOW=	555.82		
TOTAL POP.=	3530						

POINT "C"	Peaking Factor= 1.98		Demand Factor= 0.344				
PARCEL DESIGNATION	DWELLING UNITS	AREA (ac)	WET WEATHER IN. (gpm)	SEWER FLOW (gpm)	TOTAL FLOW (gpm)	PIPE SIZE (inch.)	FIGURE 3 MANHOLE NO.
Point "B"	1412	267.6	46.46	503.63	550.08	12	
1_4 E	99	13.7	2.38	34.03	36.41		
1_5	117	19.3	3.35	40.22	43.57		
1_6	104	17.5	3.04	35.75	38.79		
1_7	136	19.5	3.38	46.75	50.13		
1_9 (School)	-	14.7	2.56	30.67	33.22		
2_1	123	18.4	3.19	42.28	45.47	15	
TOTAL DU'S=	1991			TOTAL SYSTEM FLOW=	797.68		
TOTAL POP.=	4978						

POINT "D"	Peaking Factor= 2.36		Demand Factor= 0.410				
PARCEL DESIGNATION	DWELLING UNITS	AREA (ac)	WET WEATHER IN. (gpm)	SEWER FLOW (gpm)	TOTAL FLOW (gpm)	PIPE SIZE (inch.)	FIGURE 3 MANHOLE NO.
1_2	128	21.2	3.68	52.44	56.12		
1_3	217	25.3	4.40	88.91	93.31		
1_4 W	74	10.3	1.79	30.32	32.11	8	
TOTAL DU'S=	419			TOTAL SYSTEM FLOW=	181.54		
TOTAL POP.=	1048						

POINT "E"	Peaking Factor= 2.25		Demand Factor= 0.391				
PARCEL DESIGNATION	DWELLING UNITS	AREA (ac)	WET WEATHER IN. (gpm)	SEWER FLOW (gpm)	TOTAL FLOW (gpm)	PIPE SIZE (inch.)	FIGURE 3 MANHOLE NO.
2_5	141	20.3	3.53	55.08	58.61	8	
2_6	95	23.0	3.99	37.11	41.10		
2_7	130	24.0	4.17	50.78	54.95		
2_8	113	17.2	2.99	44.14	47.13		
2_9	157	28.5	4.95	61.33	66.28		
2_10	-	17.6	3.06	36.69	39.74	10	
TOTAL DU'S=	636			TOTAL SYSTEM FLOW=	307.82		
TOTAL POP.=	1590						

POINT "F"	Peaking Factor= 2.09		Demand Factor= 0.363				
PARCEL DESIGNATION	DWELLING UNITS	AREA (ac)	WET WEATHER IN. (gpm)	SEWER FLOW (gpm)	TOTAL FLOW (gpm)	PIPE SIZE (inch.)	FIGURE 3 MANHOLE NO.
Point "E"	636	130.7	22.69	267.46	290.15	10	
2_2	138	28.6	4.97	50.07	55.04		
2_3	165	25.0	4.34	59.87	64.21		
2_4	143	23.8	4.13	51.89	56.02		
3_9	134	21.3	3.70	48.62	52.33	12	
TOTAL DU'S=	1216			TOTAL SYSTEM FLOW=	517.75		
TOTAL POP.=	3040						

Pump Station "1"	Peaking Factor= 1.94		Demand Factor= 0.337				
PARCEL DESIGNATION	DWELLING UNITS	AREA (ac)	WET WEATHER IN. (gpm)	SEWER FLOW (gpm)	TOTAL FLOW (gpm)	PIPE SIZE (inch.)	FIGURE 3 MANHOLE NO.
Point "C"	1991	370.7	64.35	719.50	783.85		
Point "D"	419	56.9	9.87	141.12	150.99		
TOTAL DU'S=	2410			TOTAL SYSTEM FLOW=	934.84		
TOTAL POP.=	6025						

Pump Station "2"	Peaking Factor= 2.09		Demand Factor= 0.363				
PARCEL DESIGNATION	DWELLING UNITS	AREA (ac)	WET WEATHER IN. (gpm)	SEWER FLOW (gpm)	TOTAL FLOW (gpm)	PIPE SIZE (inch.)	FIGURE 3 MANHOLE NO.
Point "F"	1216	229.5	39.84	477.91	517.75		
TOTAL DU'S=	1216			TOTAL SYSTEM FLOW=	517.75		
TOTAL POP.=	3040						

Appendix C —

Arizona Department of Environmental Quality Administrative Code Sections

or control to the downstream point where the sewer delivers wastewater to a sewage collection system owned or controlled by a public or private sewer utility, or to a sewage treatment facility.

2. A sewer collection system repair is not an expansion of the system that requires a Notice of Intent to Discharge. Repairs include work performed in response to deterioration of existing structures, devices, and appurtenances with the intent to maintain or restore the system to its original operational characteristics.

B. Performance. An applicant shall design, construct, and operate a sewage collection system so that it:

1. Provides adequate wastewater flow capacity for the planned service;
2. Minimizes sedimentation, blockage, and erosion through maintenance of proper flow velocities throughout the system;
3. Prevents sanitary sewer overflows through appropriate sizing, capacities, and inflow and infiltration prevention measures throughout the system;
4. Protects water quality through minimization of exfiltration losses from the system;
5. Provides for adequate inspection, maintenance, testing, visibility, and accessibility; and
6. Maintains system structural integrity.

C. Notice of Intent to Discharge. In addition to the Notice of Intent to Discharge requirements specified in R18-9-A301(B), an applicant shall submit the following information:

1. A statement, signed by the owner or operator of the sewage treatment facility that treats or processes the sewage from the proposed sewer collection system.
   a. The owner or operator shall affirm that the additional volume of wastewater delivered to the facility by the proposed sewer collection system will not cause any flow or effluent quality limits of the individual permit for the facility to be exceeded.
   b. If the facility is classified as a groundwater protection permit facility under A.R.S. § 49-241.01(C), or if no flow or effluent limits are applicable, the owner or operator shall affirm that the design flow of the facility will not be exceeded.
2. If the proposed sewage collection system delivers wastewater to a downstream sewer collection system under different ownership or control, a statement, signed by the owner or operator of the downstream sewer collection system, affirming that the downstream system can maintain the performance required by subsection (B) if it receives the increased flows associated with the new system or the expansion;
3. A general site plan showing the boundaries and key aspects of the project;
4. Construction quality drawings that provide overall details of the site and the engineered works comprising the project including:
   a. Relevant plans and profiles of sewer lines, force mains, manholes, and lift stations with sufficient detail to allow Department verification of design and performance characteristics;
   b. Relevant cross sections showing construction details and elevations of key components of the sewer collection system to allow Department verification of design and performance characteristics, including the slope of each gravity sewer segment stated as a percentage; and
   c. Drainage features and controls, and erosion protection as applicable, for the components of the project.
5. Documentation of design flows for significant components of the sewage collection system and the basis for calculating the design flows;
6. An operation and maintenance plan if the project has a design flow of more than 10,000 gallons per day;
7. Drawings, reports, and other information that are clear, reproducible, and in a size and format specified by the Department. The applicant may submit the drawings in a Department-approved electronic format; and
8. Design documents, including plans, specifications, drawings, reports, and calculations that are signed and sealed by an Arizona-registered professional engineer unless prohibited by law. The designer shall use good engineering judgement following engineering standards of practice, and rely on appropriate engineering methods, calculations, and guidance.

D. Design requirements.

1. General Provisions. An applicant shall ensure that the design, installation, and testing of a new sewage collection system or an expansion to an existing sewage collection system involving new construction complies with the following rules. An applicant shall:
   a. Base design flows for components of the system on unit flows specified in Table 1, Unit Daily Design Flows. If documented by the applicant, the Department may accept lower unit flow values in the served area due to significant use of low flow fixtures.
   b. Use the "Uniform Standard Specifications for Public Works Construction," referenced in this Section and published by the Maricopa Association of Governments, revisions through 2000, or the "Pima County Wastewater Management," November 1994 Edition, as the applicable design and construction criteria, unless the Department approved alternative design standards or specifications authorized by a delegation agreement under A.R.S. § 49-107.
   c. Use gravity sewer lines, if appropriate. The applicant shall design gravity sewer lines and all other sewer collection system components, including force mains, manholes, lift stations, and appurtenant devices and structures to accommodate maximum sewage flows as determined by the method specified in subsections (D)(1)(c)(i) or (D)(1)(c)(ii) that yields the greatest calculated flow:
      i. Any point in a sewer main when flowing full can accommodate an average flow of 100 gallons per capita per day for all populations upstream from that point, or
      ii. Any point in a sewer collection system can accommodate a peak flow for all populations upstream from that point as tabulated below:

Upstream Population	Peaking Factor
100	3.62
200	3.14
300	2.90
400	2.74
500	2.64
600	2.56
700	2.50
800	2.46
900	2.42
1000	2.38
1001 to 10,000	$PF = (6.330 \times p^{-0.231}) + 1.094$
10,001 to 100,000	$PF = (6.177 \times p^{-0.233}) + 1.128$
More than 100,000	$PF = (4.500 \times p^{-0.174}) + 0.945$
PF = Peaking Factor p = Upstream Population	

d. Ensure the separation of sewage collection system components from drinking water distribution system components under R18-4-502.
e. Request review and approval of an alternative to a design feature specified in this Section by following the requirements of R18-9-A312(G).

2. Gravity sewer lines. An applicant shall:
   a. Ensure that any sewer line that runs between manholes, if not straight, is of constant horizontal curvature with a radius of curvature not less than 200 feet;
   b. Cover each sewer line with at least three feet of backfill meeting the requirements of subsection (D)(2)(h)(i). The applicant shall:
      i. Include at least one note specifying this requirement in construction plans;
      ii. If site-specific limitations prevent three feet of earth cover, provide the maximum cover attainable, and construct the sewer line of ductile iron pipe or other materials of equivalent or greater tensile and compressive strength;
      iii. If ductile iron pipe is not used, design and construct the sewer line pipe with restrained joints or an equivalent feature; and
      iv. Ensure that the design of the pipe and joints can withstand crushing or shearing from any expected load. Construction plans shall note locations requiring these measures.
   c. If sewer lines cross floodways, place the lines at least two feet below the 100-year storm scour depth and construct the lines using ductile iron pipe or pipe with equivalent tensile strength, compressive strength, shear resistance, and scour protection. The applicant shall ensure that sewer lines constructed in this manner extend at least 10 feet beyond the boundary of the 100-year storm scouring. Construction plans shall note locations requiring these measures.
   d. Ensure that each sewer line is eight inches in diameter or larger except:
      i. The first 400 feet of a dead end sewer line with no potential for extension may be six inches in diameter if the design flow criteria specified in subsection (D)(1)(c) are met. If the line is ever extended, the applicant seeking the extension shall replace the entire length with larger pipe to accommodate the new design flow; or
      ii. The sewer lines for a sewage collection system for a manufactured home, mobile home, or recreational vehicle park are not less than four-inches in diameter for up to 20 units, five-inches in diameter for 21 to 36 units, and six-inches in diameter for 37 to 60 units.
   e. Design sewer lines with at least the minimum slope calculated from Manning's Formula using a coefficient of roughness of 0.013 and a sewage velocity of two feet per second when flowing full.
      i. An applicant may request a smaller minimum slope under R18-9-A312(G) if the smaller slope is justified by a quarterly program of inspections, flushings, and cleanings.
      ii. If a smaller minimum slope is requested, the slope shall not be less than 50% of that calculated from Manning's formula using a coefficient of roughness of 0.013 and a sewage velocity of two feet per second.
   f. Design sewer lines to avoid a slope that creates a sewage velocity greater than 10 feet per second. The applicant shall construct any sewer line carrying a flow with a normal velocity of greater than 10 feet per second using ductile iron pipe or pipe with equivalent erosion resistance, and structurally reinforce the receiving manhole or sewer main.
   g. Design and install sewer lines, connections, and fittings with materials that meet or exceed manufacturer's specifications not inconsistent with this Chapter to:
      i. Limit inflows, infiltration, and exfiltration;
      ii. Resist corrosion in the project electrochemical environment;
      iii. Withstand anticipated live and dead loads; and
      iv. Provide internal erosion protection.
   h. Indicate trenching and bedding details applicable for each pipe material and size in the design plans. Sewer lines shall be placed in trenches and bedded following the specifications established in subsections (D)(2)(h)(i) and (D)(2)(h)(ii). This material is incorporated by reference and does not include any later amendments or editions of the incorporated matter. Copies of the incorporated material are available for inspection at the Department of Environmental Quality and the Office of the Secretary of State, or may be obtained from the Maricopa Association of Governments, 302 N. 1st Avenue, Suite 300, Phoenix, Arizona 85003, or from Pima County Wastewater Management, 201 N. Stone Avenue, Tucson, Arizona 85701-1207.
      i. "Trench Excavation, Backfilling, and Compaction" (Section 601), published in the "Uniform Standard Specifications for Public Works Construction," published by the Maricopa Association of Governments, revisions through 2000; and
      ii. "Rigid Pipe Bedding for Sanitary Sewers" (WWM 104), and "Flexible Pipe Bedding for Sanitary Sewers" (WWM 105), published by Pima County Wastewater Management, revised November 1994.
   i. Perform a deflection test of the total length of all sewer lines made of flexible materials to ensure that the installation meets or exceeds the manufacturer's recommendations and record the results.

MANAGEMENT TEAM MEETING AGENDA

Friday, September 22, 2006

1. Old Business
   - Landscaping- follow up discussion re: marketability of projects
     (Jim Haupert available by cell phone @ 602-418-9000,
     due back in town Tuesday evening)

2. New Business
   - Project status update
   - Bob Watt- comparison of La Privada vs. flowchart

MANAGEMENT TEAM MEETING AGENDA

Monday, September 18, 2006

1. Old Business
   - Timeline
   - Pending items prior to rollout

2. Scribe position-
   - Meeting with De'Anne Wagoner @ 9:45 am
   - Discussion re: conversations w/Alison, Mike Walla, Jennifer

3. New Business
   - Steve Tomita- landscaping issue

ATTACHMENT 13

Preliminary Water and Sewer Report for MONTESSA

Town of Florence
Pinal County, Arizona

March 6, 2006

Prepared for:

B&B2 LLC
699 S. Mill Ave., #320
Tempe, AZ 85281
480.929.0444

Prepared by:

Sunrise Engineering, Inc.
2152 S. Vineyard, Suite 123
Mesa, AZ 85210
480.768.8600

SUNRISE

Preliminary Water and Sewer Report

for

MONTESSA

Town of Florence
PINAL COUNTY, ARIZONA

Prepared for: B & B2 LLC
699 S. Mill Ave., #320
Tempe, AZ 85281
(480) 929-0444
Contact: Blake McKee

Prepared by: Sunrise Engineering, Inc.
2152 South Vineyard, Suite 123
Mesa, Arizona 85210
(480) 768-8600
Contact: Joel A. Watson, P.E.

Date: March 6, 2006

1.0 Introduction

The purpose of this report is to present preliminary findings with respect to water and sewer service for the proposed development known as Montessa.

The project site is located within the Southeast Quarter of the Northeast Quarter of Section 36, Township 4 South, Range 8 East (Gila and Salt River Meridian, Maricopa County, Arizona). More specifically, the site is on the West side of Attaway Road approximately 1400' South of the intersection of Attaway Road and Hunt Highway in Pinal County Arizona. See map below.

2.0 Existing Conditions and Offsite Connections

The existing condition is level undeveloped desert. There are no water and sewer facilities that front the parcel nor are there any facilities nearby.

It is early in the development of this parcel. Water and Sewer service will most likely come through the future Monterra subdivision currently in the planning stages. Monterra is located directly across Attaway Road from this parcel.

Water and Sewer service for Monterra will ultimately be owned by the Town of Florence. Facilities include several wells on site that will be converted from agricultural to potable use.

A Wastewater Treatement Plant (WWTP) is currently under design as part of the Merrell Ranch subdivision. The WWTP will be located at the eastern boundary of Monterra. Completion is expected August of 2006.

Sewer service within Monterra will be by gravity running to the south of the site where 1 or more lift stations will convey wastewater to the new WWTP.

3.0 Design

All design shall adhere to Town of Florence and ADEQ standards.

Most likely a 12" main will be required extending over from Monterra. Within the subdivision all water lines will be 8" with some fire hydrant runs being 6"

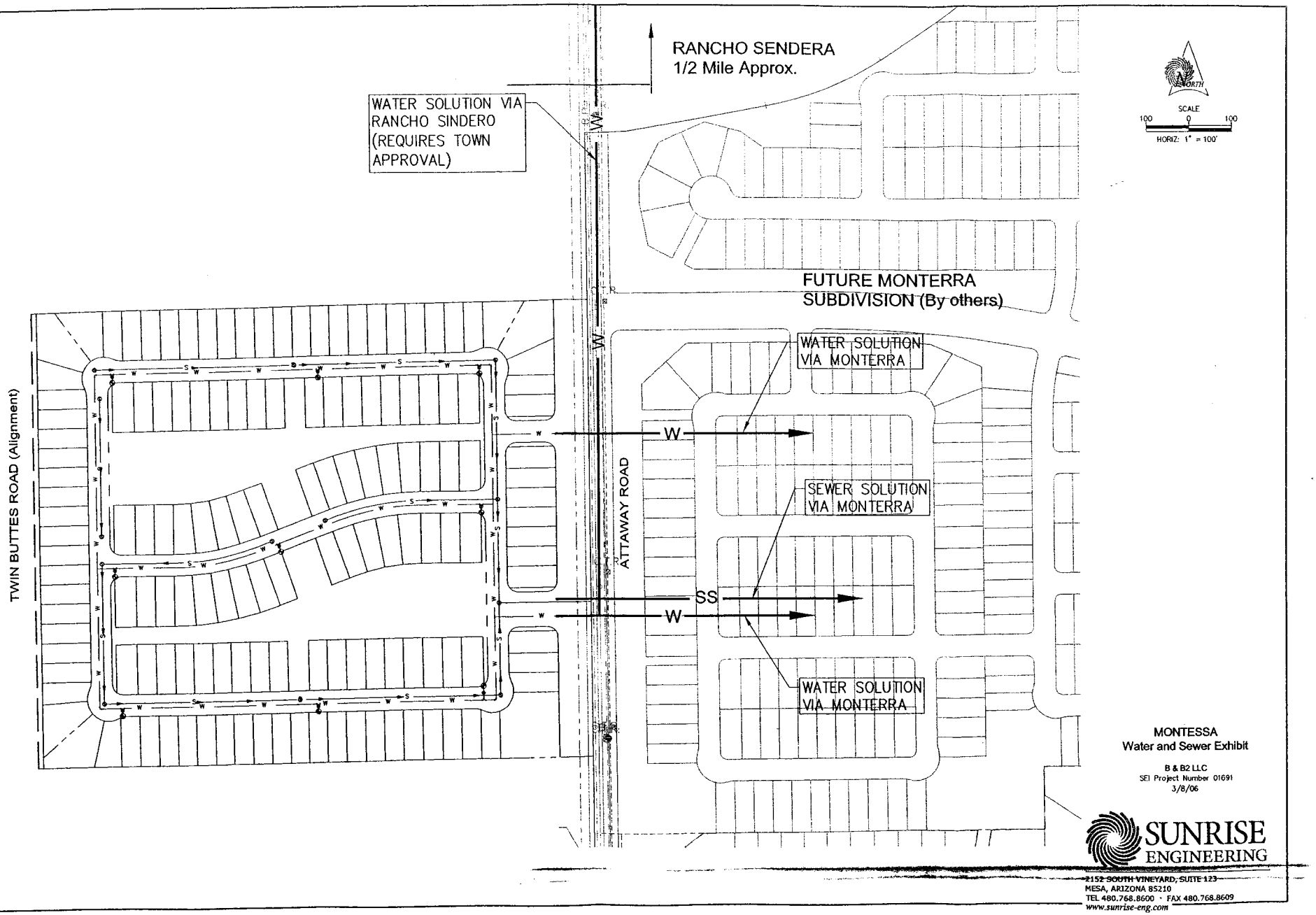
All other lines in the subdivision are 8". The alignment and sizes of the proposed waterlines are as shown in the Water and Sewer Exhibit. The water lines are located within the right of way or easement and service all the lots in the subdivision.

The minimum water line pipe diameter size of six inches is required to accommodate fire hydrants. The minimum waterline diameter is eight inches for dead-end hydrant lines longer than 300'. Sewer/Water Crossings were avoided. However, all crossings shall conform to ADEQ APP R18-4-502.C. The water lines and sewer lines must have a minimum wall to wall horizontal separation of 6 feet and vertical separation of 2 feet in accordance with MAG Standard Detail 404.

During a shutdown, no more than 30 homes nor two fire hydrants shall be out of service. The maximum spacing for fire hydrants shall be 500 feet for this subdivision. Fire hydrants shall be constructed per MAG Standard Detail 360.

There is a minimum of three valves at all crosses, two at all tees, and one at each fire hydrant tee. No more than four valves shall be required to shut down any section of waterline in the system. All valve blocking shall be constructed per MAG Standard Detail 301.

The system shall be capable of sustaining the required amount of pressure during peak flows. There must also be available fire flow to the system given the required demand of 1,000 gallons per minute (gpm) per the Uniform Fire Code. An approximate minimum pressure of 20 pounds per square inch (psi) is desirable at all junctions in the system given this fire flow demand.



MONTESSA
Water and Sewer Exhibit

B & B2 LLC
SEI Project Number 01691
3/8/06

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 · FAX 480.768.8609
www.sunrise-eng.com

ATTACHMENT 14

Preliminary Water Report

For

WALKER BUTTE PHASE 1

Prepared For:
United Engineering Group
4505 E. Chandler Blvd., Suite 170
Phoenix, AZ 85048

Prepared By:
Olsson Associates
7250 North 16th Street, Suite 210
Phoenix, AZ 85020
602-748-1000

May 23, 2006

OLSSON ASSOCIATES

OA #20051479

Preliminary Water Report
for
Walker Butte Phase 1

Table of Contents

1.0 Introduction

Walker Butte Phase 1 is part of the larger 1720-acre master planned community located in the Town of Florence, Pinal County, Arizona. Phase 1 encompasses Sections 14 and 23 of Township 4 South, Range 8 East of the Gila and Salt River Meridian. The total area of Phase 1 is approximately 348-acres with 1305 single family homes and a 15-acre school site. The project abuts the Hiller Road alignment on the north, State Land on the west and east, and north of the Franklin Road alignment. Figure 1 presents the project location.

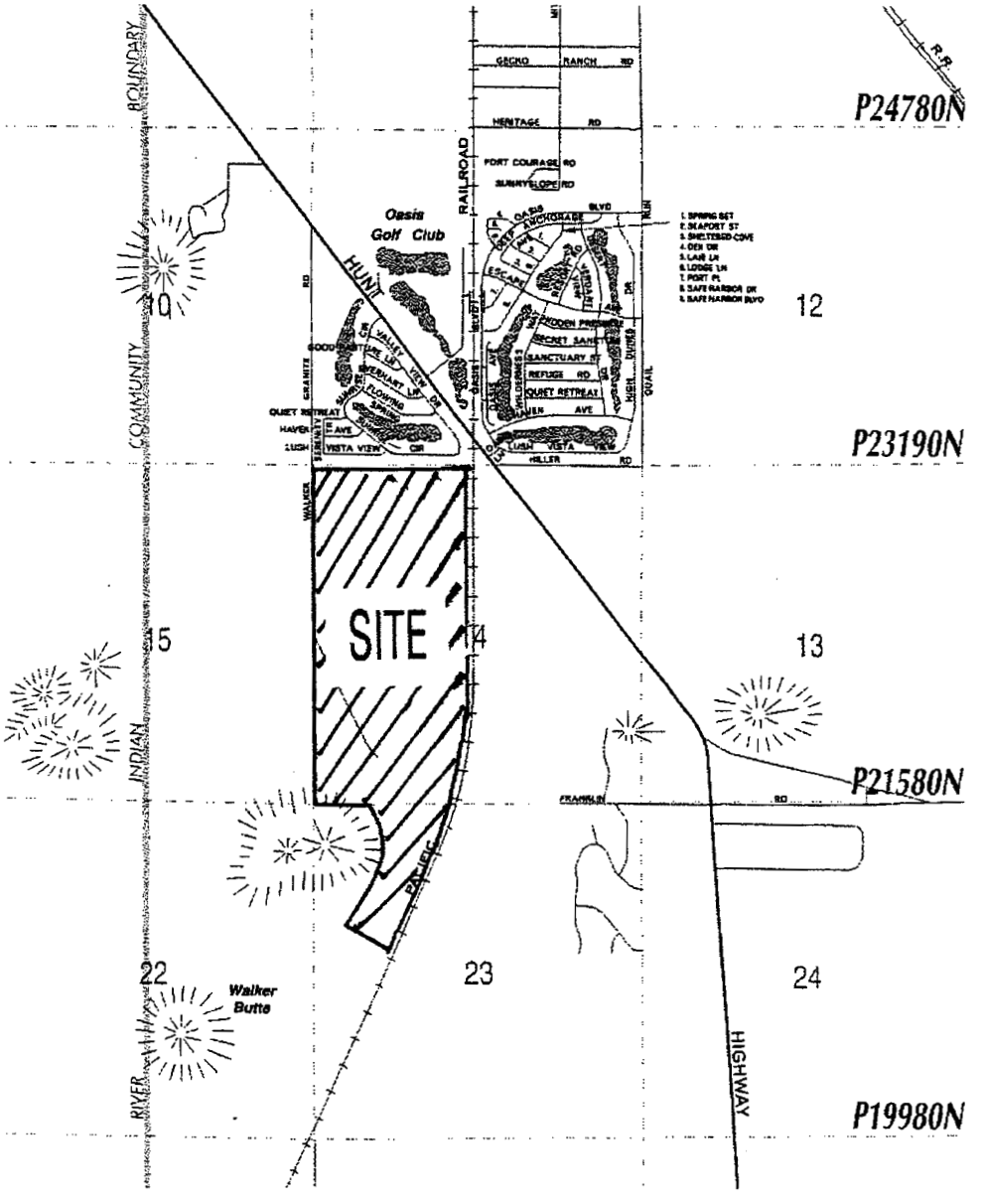


Figure 1. Project Location Map

Walker Butte is located within the CC&N area of Johnson Utility Companies (JUC). JUC has agreed to include additional project water demands in current water infrastructure. The Town of Florence Fire Department will provide fire protection to the project. This preliminary water report is prepared for compliance with JUC, Town, County, and State agencies design requirements for potable water. The Walker Butte Planned Unit Development consists of a plan for single family, multi-family, park, commercial, public facilities, cluster housing and school within the overall proposed development. Phase 1 consists of only single family residential development and a 15-acre school site. A water model is generated to reflect the preliminary plat lot configuration. Both the domestic and fire flows have been modeled to ensure the system has adequate pressure to serve the entire project.

This report reviews current water infrastructure and determines if Walker Butte's contributing water demand will not jeopardize current system capacity. According to previous discussions with Johnson Utilities, water pressure and water line sizes will be accommodated in infrastructure development prior to the completion of Walker Butte. The report also presents an onsite master water plan and pressure analysis of the proposed water lines in Walker Butte and that they meet pressure standards as set by JUC, Town, City, State and Federal requirements. The report provides water system design criteria following Town of Florence, Arizona and Federal requirements (Arizona Administrative Code by the Arizona Department of Environmental Quality Bulletin 11 and Title 18, Chapter 9 of the Aquifier Protection Permit).

Walker Butte falls completely within a Gila River Indian Community (GRIC) agreement area where limitations are set for wet well drilling. According to previous discussions with JUC, it was an understanding that Walker Butte would not be required to drill wells; however, anticipation to complete two 1-million gallon storage tanks would be required with one 1-million gallon storage tank constructed with Phase 1.

2.0 Water Distribution System Infrastructure

Based on Walker Butte's location, there is no adjacent water infrastructure for connection. Walker Butte is located within the Pinal County AMA with closest water infrastructure approximately 1.5 miles away at the intersection of Merrill Ranch Parkway and Hunt Highway. An offsite waterline connection will be required to connect at this intersection either through State Land or along the Franklin Road alignment to Hunt Highway and then south to the intersection. Connections may be closer since Anthem at Merrill Ranch may come online prior to Walker Butte construction. An 8-inch waterline to offsite will connect directly to

the water campus of Phase 1. A one-million gallon tank with pumping station will be constructed as a water source for Phase 1. A water campus site (located in the east side of Unit 5) is provided for JUC to accommodate all the facilities.

According to JUC, Walker Butte is located in an area where the Assured Water Supply is provided. Wet wells located outside of the Walker Butte project limits will provide the system the source for water. The design of the water campus will be provided by JUC.

3.0 Water Design Criteria

The design of the water system follows Johnson Utilities Company, Town of Florence City Code, Town Engineer criteria, ADEQ's Bulletin 10, and the Arizona Administrative Code. A summary of design criteria is presented in this section for proposed development of Walker Butte Phase 1.

3.1 Design Population

The source for the Walker Butte residential lot density comes from the County approved Planned Unit Development Narrative for Walker Butte dated January 28, 2005. Tables 1 and 2 provide the population information for single family residential and school development.

Table 1. Residential Design Parameters

Type of Lots	Single Family
Units	1362
Average Daily Flow	260 gallons/unit/day
Peak Day Factor	2
Peak Hour Factor	3

Table 2. Commercial/School Design Parameters

Use	Average Day Flow	Peak Hour Factor
Commercial/School	1500 gallons/acre/day	3

3.2 Waterline Design

The design parameters for this project used the Johnson Utilities Company "Design Guide and Standard Details" dated August 2005. The following criteria are provided in list form for design of water system for Walker Butte:

1. For average day system flow, minimum pressure conditions are 40 psi and maximum pressure of 80 psi.
2. Fire flow demand and storage requirements are 1000 gpm for 2 hours with residual pressure of 20 psi or per UFC, whichever is higher in residential

areas.

3. A 12-inch diameter water line is required for the arterial road within Walker Butte. According to previous discussions with JUC, this was an acceptable line size since there will be minimal development west of the site.
4. An 8-inch diameter water line is required along all local streets adjacent to the arterial road, on dead end lines longer than 30-feet, or when the length of the waterline between intersecting waterlines is greater than 1200-feet. The system shall be fully looped with intersecting water lines.
5. All other water lines shall be a minimum of 6-inches in diameter and fully looped with intersecting water lines.
6. The standard location for 16-inch and smaller water lines is eleven feet from centerline on the opposite side of the sewer or as indicated by Town requirements. The lines shall be placed in either the public right-of-way or within a dedicated easement free of property lines, boundary walls, and other obstructions for its entire length and width.
7. Water lines, service lines, and fire lines are not allowed in retention basins.
8. Two valves are normally required on all tees and three valves required on all crosses.
9. Two valves are not required on fire hydrant tees unless fire hydrant installation is also serving as a stub-out.
10. Additional isolation valves are normally required at approximately 600-feet intervals or when pipe runs longer than 800 feet are required.
11. A bypass type valve assembly is normally required whenever a transmission main is dead-ended with a curb stop required at the end of the main.
12. Fire hydrants are generally spaced every 500-feet in single family residential areas and 300 feet in all other areas.
13. Six fire hydrants are the maximum number that may be connected to a system that is supplied by only two 6-inch diameter water lines.
14. Pipes shall be pressure rated polyvinyl chloride (PVC) plastic pipe meeting the applicable requirements of AWWA C900-81.
15. The pipe pressure rating shall be pressure class 150 psi (DR-18).
16. Water storage facilities shall be sized to provide a usable volume equal to and no less than approximately 48% of the peak day demand plus 120,000 gallons for fire protection.

4.0 Water Model

The water model will be run using the WaterCAD, version 7.0 program using information as provided by the criteria as stated in Section 3.

4.1 Onsite Design

The total residential and school demand is calculated below. Specific subarea calculations for nodes provided in the model are located in Appendix B. A water storage facilities calculation is provided at the end of this section.

The total domestic residential flow can be calculated as follows:

Single Family:

Total Population:	1305 Dwelling Units
Average Daily Flow:	1,305 x 260 = 339,300 gallons per day (gpd)
Peak Daily Flow:	339,300 x 2 = 678,600 gpd = 472 gpm
Peak Hour Flow Rate:	339,300 x 3 = 1,017,900 gpd = 707 gpm

Total Residential Peak Day Flow: **= 472 gpm**
Total Residential Hourly Peak Hour Flow: **= 707 gpm**

Commercial use, schools, parks, community centers and equestrian centers is estimated using 1,500 gallons per day per acre. Based on this assumption, the total school water demand is calculated as below:

School Area = 15.0 acres

School Average Day Flow: = 15 x 1,500 = 22,500 gpm

Total Commercial Peak Day Flow: **=22,500 gpd*2 = 45,000 gpd = 32 gpm**
Total Commercial Hourly Peak Flow: **= 22,500gpd*3 = 67,500 gpd = 47 gpm**

Water storage facilities shall be sized to provide a usable volume equal to and no less than approximately 48% of the peak day demand plus 120,000 gallons for fire protection.

Total Volume Required = 0.48 * Peak Day Demand + Fireflow

Total Volume Required:= 0.48*(678,600+45,000)+120,000=467,328 gallons

4.2 Model Assumptions

The water distribution system is analyzed using Version 7.0 of WaterCAD developed by Haestad Methods. Design assumptions follow the original Master Plan as shown below:

1. The system was simulated with a constant water pressure of 70 psi at the water reservoir.
2. Hazen-Williams Formula for all friction loss calculations.
3. Water is assumed to be 20°C (68°F)

4. All pipe lengths are rounded to the nearest foot.
5. Elevation all piping is based on a topographic survey of the site.
6. C factor of 140 for PVC in accordance with recommendation from Johnson Utilities.
7. Minor losses including valves and fittings are negligible.
8. Minimum pipe size is 6" in diameter.

4.3 Simulation Procedure

Walker Butte Phase 1 was modeled in one WaterCAD model. The objective is to provide adequate domestic flows to all homes and school with a minimum of residual pressure of 40 psi and a maximum pressure of 80 psi without the fire flow. When there is a fire flow in any one place, the residual pressures in the system are maintained above 20 psi but below 80 psi. The residential fire flow is 1,000 gpm for residential and 1,500 gpm for school.

With respect to design, a water modeling map is shown in the Appendix. An 8-inch water line extension from the intersection of Hunt Highway and Merrill Ranch Parkway is required to fill the reservoir. No offsite pressures were considered in the model since a one-million gallon reservoir with booster pumps can maintain pressure requirements. The system was simulated with a constant water pressure of 70 psi at the water reservoir.

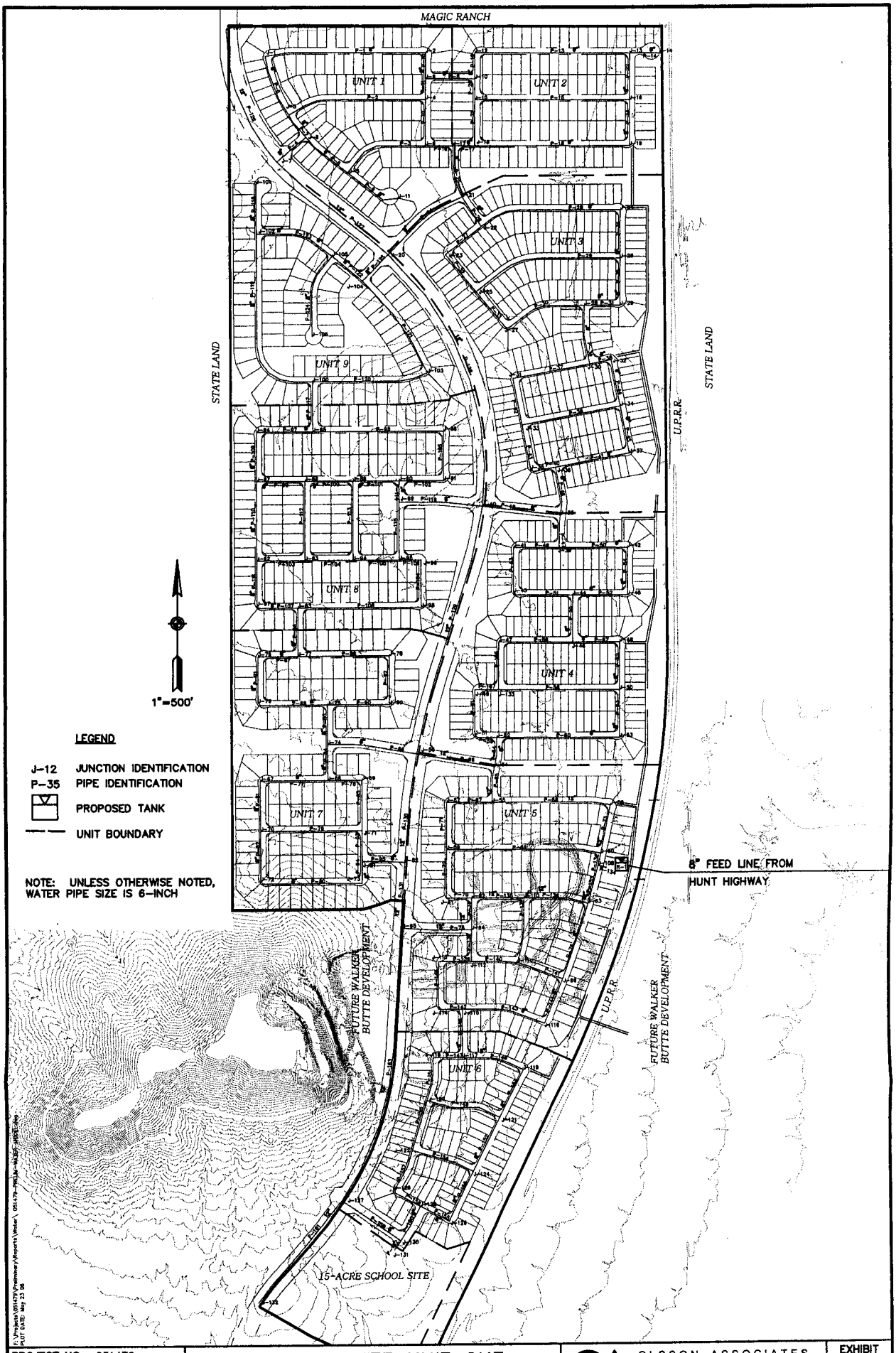
Final model calculations from WaterCAD are included in the Appendix.

5.0 Conclusions and Recommendations

In summary, 1,305 residential homes and a school will be added to the JUC existing water infrastructure. Criteria was established with this report and incorporated into the Walker Butte water model. Based on water model results, average day system flow will maintain minimum pressure conditions at 40 psi and maximum pressure of 80 psi. Fire flow demand and storage requirements are met with 1000 gpm for residential and 1500 gpm for school for 2 hours with residual pressure of 20 psi. A 1-million gallon reservoir with pumps are anticipated to supplement JUC infrastructure. A water system of looped interconnected pipes will be provided as shown in the water master plan. According to the understanding of the GRIC agreement, no wet wells will be required for Walker Butte. Waterline connection points will be required to tie Walker Butte with the Pinal County AMA water system as identified previously. According to previous discussions with Johnson Utilities, water pressure and water line sizes will be accommodated in infrastructure development prior to the completion of Walker Butte.

Appendix A

Design Documentation



PROJECT NO: 051479	WALKER BUTTE UNIT ONE PRELIMINARY WATER MASTER PLAN	OLSSON ASSOCIATES ENGINEERS – PLANNERS – SCIENTISTS – SURVEYORS 7250 N. 16TH STREET, SUITE 210 – PHOENIX, ARIZONA 85020 PH. 602-748-1000 – FAX 602-748-1001	EXHIBIT
DRAWN BY: PV			1
DATE: 05/23/06			

C:\Projects\051479\Preliminary\Reports\Water\ 051479-PRELIM-WATER REPORT.dwg PLOT DATE: May 23 06

Project: Walker Butte Unit 1

Location: Pinal County, South of Hunt Highway and Hiller Road

ADD/DU (gpd) 260

MDD/DU (gpd) 520

PHD/DU (gpd) 780

Fire Flow Demand (gpm) 1,000

(1) Fire Flow Demand equals MDD+FFD (1,000 gpm). Total Fire Flow equals total MDD+FFD (1,000 gpm)

Water Demands

Node	Parcel	No. of Units	Average Day Demand (ADD)		Maximum Day Demand (MDD)		Peak Hour Demand (PHD)		(1)Fire Flow Demand
			(gpd)	(gpm)	(gpd)	(gpm)	(gpd)	(gpm)	(gpm)
J-1	1	20	5,200	3.6	10,400.0	7.2	15,600.0	10.8	1,007.2
J-2	1	19	4,940	3.4	9,880.0	6.9	14,820.0	10.3	1,006.9
J-3	1	15	3,900	2.7	7,800.0	5.4	11,700.0	8.1	1,005.4
J-4	1	19	4,940	3.4	9,880.0	6.9	14,820.0	10.3	1,006.9
J-5	1	13	3,380	2.3	6,760.0	4.7	10,140.0	7.0	1,004.7
J-6	1	10	2,600	1.8	5,200.0	3.6	7,800.0	5.4	1,003.6
J-7	1	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-8	1	7	1,820	1.3	3,640.0	2.5	5,460.0	3.8	1,002.5
J-9	1	2	520	0.4	1,040.0	0.7	1,560.0	1.1	1,000.7
J-10	2	2	520	0.4	1,040.0	0.7	1,560.0	1.1	1,000.7
J-11	1	7	1,820	1.3	3,640.0	2.5	5,460.0	3.8	1,002.5
J-12	2	19	4,940	3.4	9,880.0	6.9	14,820.0	10.3	1,006.9
J-13	2	18	4,680	3.3	9,360.0	6.5	14,040.0	9.8	1,006.5
J-14	2	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-15	2	19	4,940	3.4	9,880.0	6.9	14,820.0	10.3	1,006.9
J-16	2	19	4,940	3.4	9,880.0	6.9	14,820.0	10.3	1,006.9
J-17	2	2	520	0.4	1,040.0	0.7	1,560.0	1.1	1,000.7
J-18	2	19	4,940	3.4	9,880.0	6.9	14,820.0	10.3	1,006.9
J-19	2	17	4,420	3.1	8,840.0	6.1	13,260.0	9.2	1,006.1
J-20	2	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-21	2	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-22	3	22	5,720	4.0	11,440.0	7.9	17,160.0	11.9	1,007.9
J-23	3	10	2,600	1.8	5,200.0	3.6	7,800.0	5.4	1,003.6
J-24	3	20	5,200	3.6	10,400.0	7.2	15,600.0	10.8	1,007.2
J-25	3	24	6,240	4.3	12,480.0	8.7	18,720.0	13.0	1,008.7
J-26	3	22	5,720	4.0	11,440.0	7.9	17,160.0	11.9	1,007.9
J-27	3	16	4,160	2.9	8,320.0	5.8	12,480.0	8.7	1,005.8
J-28	3	12	3,120	2.2	6,240.0	4.3	9,360.0	6.5	1,004.3
J-29	3	8	2,080	1.4	4,160.0	2.9	6,240.0	4.3	1,002.9
J-30	4	12	3,120	2.2	6,240.0	4.3	9,360.0	6.5	1,004.3
J-31	4	15	3,900	2.7	7,800.0	5.4	11,700.0	8.1	1,005.4
J-32	4	3	780.0	0.5	1,560.0	1.1	2,340.0	1.6	1,001.1
J-33	4	18	4,680	3.3	9,360.0	6.5	14,040.0	9.8	1,006.5
J-34	4	16	4,160	2.9	8,320.0	5.8	12,480.0	8.7	1,005.8
J-35	4	7	1,820	1.3	3,640.0	2.5	5,460.0	3.8	1,002.5
J-36	4	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-37	4	15	3,900	2.7	7,800.0	5.4	11,700.0	8.1	1,005.4
J-38	4	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-39	4	14	3,640	2.5	7,280.0	5.1	10,920.0	7.6	1,005.1
J-40	4	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-41	4	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-42	4	10	2,600	1.8	5,200.0	3.6	7,800.0	5.4	1,003.6

Node	Parcel	No. of Units	Average Day Demand (ADD)		Maximum Day Demand (MDD)		Peak Hour Demand (PHD)		[1]Fire Flow Demand
			(gpd)	(gpm)	(gpd)	(gpm)	(gpd)	(gpm)	(gpm)
J-43	4	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-44	4	15	3,900	2.7	7,800.0	5.4	11,700.0	8.1	1,005.4
J-45	4	11	2,860	2.0	5,720.0	4.0	8,580.0	6.0	1,004.0
J-46	4	14	3,640	2.5	7,280.0	5.1	10,920.0	7.6	1,005.1
J-47	4	13	3,380	2.3	6,760.0	4.7	10,140.0	7.0	1,004.7
J-48	4	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-49	4	7	1,820	1.3	3,640.0	2.5	5,460.0	3.8	1,002.5
J-50	4	20	5,200	3.6	10,400.0	7.2	15,600.0	10.8	1,007.2
J-51	4	4	1,040	0.7	2,080.0	1.4	3,120.0	2.2	1,001.4
J-52	4	16	4,160	2.9	8,320.0	5.8	12,480.0	8.7	1,005.8
J-53	4	19	4,940	3.4	9,880.0	6.9	14,820.0	10.3	1,006.9
J-54	5	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-55	5	15	3,900	2.7	7,800.0	5.4	11,700.0	8.1	1,005.4
J-56	5	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-57	5	8	2,080	1.4	4,160.0	2.9	6,240.0	4.3	1,002.9
J-58	5	14	3,640	2.5	7,280.0	5.1	10,920.0	7.6	1,005.1
J-59	5	19	4,940	3.4	9,880.0	6.9	14,820.0	10.3	1,006.9
J-60	5	18	4,680	3.3	9,360.0	6.5	14,040.0	9.8	1,006.5
J-61	5	6	1,560	1.1	3,120.0	2.2	4,680.0	3.3	1,002.2
J-62	5	5	1,300	0.9	2,600.0	1.8	3,900.0	2.7	1,001.8
J-63	5	11	2,860	2.0	5,720.0	4.0	8,580.0	6.0	1,004.0
J-64	5	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-65	5	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-66	5	13	3,380	2.3	6,760.0	4.7	10,140.0	7.0	1,004.7
J-67	7	8	2,080	1.4	4,160.0	2.9	6,240.0	4.3	1,002.9
J-68	7	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-69	7	4	1,040	0.7	2,080.0	1.4	3,120.0	2.2	1,001.4
J-70	7	12	3,120	2.2	6,240.0	4.3	9,360.0	6.5	1,004.3
J-71	7	13	3,380	2.3	6,760.0	4.7	10,140.0	7.0	1,004.7
J-72	7	12	3,120	2.2	6,240.0	4.3	9,360.0	6.5	1,004.3
J-73	7	11	2,860	2.0	5,720.0	4.0	8,580.0	6.0	1,004.0
J-74	7	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-75	7	11	2,860	2.0	5,720.0	4.0	8,580.0	6.0	1,004.0
J-76	7	6	1,560	1.1	3,120.0	2.2	4,680.0	3.3	1,002.2
J-77	7	10	2,600	1.8	5,200.0	3.6	7,800.0	5.4	1,003.6
J-78	7	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-79	7	10	2,600	1.8	5,200.0	3.6	7,800.0	5.4	1,003.6
J-80	7	6	1,560	1.1	3,120.0	2.2	4,680.0	3.3	1,002.2
J-81	7	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-82	7	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-83	8	15	3,900	2.7	7,800.0	5.4	11,700.0	8.1	1,005.4
J-84	8	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-85	8	17	4,420	3.1	8,840.0	6.1	13,260.0	9.2	1,006.1
J-86	8	17	4,420	3.1	8,840.0	6.1	13,260.0	9.2	1,006.1
J-87	8	12	3,120	2.2	6,240.0	4.3	9,360.0	6.5	1,004.3
J-88	8	11	2,860	2.0	5,720.0	4.0	8,580.0	6.0	1,004.0
J-89	8	11	2,860	2.0	5,720.0	4.0	8,580.0	6.0	1,004.0
J-90	8	6	1,560	1.1	3,120.0	2.2	4,680.0	3.3	1,002.2
J-91	8	5	1,300	0.9	2,600.0	1.8	3,900.0	2.7	1,001.8
J-92	8	13	3,380	2.3	6,760.0	4.7	10,140.0	7.0	1,004.7

Node	Parcel	No. of Units	Average Day Demand (ADD)		Maximum Day Demand (MDD)		Peak Hour Demand (PHD)		[1]Fire Flow Demand
			(gpd)	(gpm)	(gpd)	(gpm)	(gpd)	(gpm)	(gpm)
J-93	8	13	3,380	2.3	6,760.0	4.7	10,140.0	7.0	1,004.7
J-94	8	13	3,380	2.3	6,760.0	4.7	10,140.0	7.0	1,004.7
J-95	8	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-96	8	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-97	8	8	2,080	1.4	4,160.0	2.9	6,240.0	4.3	1,002.9
J-98	8	16	4,160	2.9	8,320.0	5.8	12,480.0	8.7	1,005.8
J-99	8	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-100	9	22	5,720	4.0	11,440.0	7.9	17,160.0	11.9	1,007.9
J-101	9	5	1,300	0.9	2,600.0	1.8	3,900.0	2.7	1,001.8
J-102	9	22	5,720	4.0	11,440.0	7.9	17,160.0	11.9	1,007.9
J-103	9	17	4,420	3.1	8,840.0	6.1	13,260.0	9.2	1,006.1
J-104	9	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-105	9	13	3,380	2.3	6,760.0	4.7	10,140.0	7.0	1,004.7
J-106	9	8	2,080	1.4	4,160.0	2.9	6,240.0	4.3	1,002.9
J-107	9	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-108	9	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-109	9	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-110	9	13	3,380	2.3	6,760.0	4.7	10,140.0	7.0	1,004.7
J-111	9	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-112	9	5	1,300	0.9	2,600.0	1.8	3,900.0	2.7	1,001.8
J-113	9	6	1,560	1.1	3,120.0	2.2	4,680.0	3.3	1,002.2
J-114	9	6	1,560	1.1	3,120.0	2.2	4,680.0	3.3	1,002.2
J-115	9	11	2,860	2.0	5,720.0	4.0	8,580.0	6.0	1,004.0
J-116	9	10	2,600	1.8	5,200.0	3.6	7,800.0	5.4	1,003.6
J-117	6	10	2,600	1.8	5,200.0	3.6	7,800.0	5.4	1,003.6
J-118	6	7	1,820	1.3	3,640.0	2.5	5,460.0	3.8	1,002.5
J-119	6	11	2,860	2.0	5,720.0	4.0	8,580.0	6.0	1,004.0
J-120	6	14	3,640	2.5	7,280.0	5.1	10,920.0	7.6	1,005.1
J-121	6	13	3,380	2.3	6,760.0	4.7	10,140.0	7.0	1,004.7
J-122	6	11	2,860	2.0	5,720.0	4.0	8,580.0	6.0	1,004.0
J-123	6	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-124	6	14	3,640	2.5	7,280.0	5.1	10,920.0	7.6	1,005.1
J-125	6	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-126	6	7	1,820	1.3	3,640.0	2.5	5,460.0	3.8	1,002.5
J-127	6	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-128	6	5	1,300	0.9	2,600.0	1.8	3,900.0	2.7	1,001.8
J-129	6	9	2,340	1.6	4,680.0	3.3	7,020.0	4.9	1,003.3
J-130	6	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-131	School	1	22,500	15.6	45,000.0	31.3	67,500.0	46.9	1,031.3
J-132	6	0	0	0.0	0.0	0.0	0.0	0.0	1,000.0
J-133	4	17	4,420	3.1	8,840.0	6.1	13,260.0	9.2	1,006.1

Appendix B

Water Model Information

Scenario: Average Day Demand
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	1,536.00	Demand	3.60	3.60	1,695.30	68.92
J-2	1,531.97	Demand	3.40	3.40	1,695.30	70.67
J-3	1,539.64	Demand	2.70	2.70	1,695.30	67.35
J-4	1,530.85	Demand	3.40	3.40	1,695.30	71.15
J-5	1,535.50	Demand	2.30	2.30	1,695.30	69.14
J-6	1,529.73	Demand	1.80	1.80	1,695.30	71.63
J-7	1,540.40	Demand	0.00	0.00	1,695.31	67.02
J-8	1,538.98	Demand	1.30	1.30	1,695.30	67.63
J-9	1,531.35	Demand	0.40	0.40	1,695.30	70.93
J-10	1,530.21	Demand	0.40	0.40	1,695.30	71.43
J-11	1,530.37	Demand	1.30	1.30	1,695.30	71.36
J-12	1,530.83	Demand	3.40	3.40	1,695.30	71.16
J-13	1,525.46	Demand	3.30	3.30	1,695.30	73.48
J-14	1,525.00	Demand	0.00	0.00	1,695.30	73.68
J-15	1,528.99	Demand	3.40	3.40	1,695.30	71.95
J-16	1,526.12	Demand	3.40	3.40	1,695.30	73.20
J-17	1,529.09	Demand	0.40	0.40	1,695.30	71.91
J-18	1,528.59	Demand	3.40	3.40	1,695.30	72.13
J-19	1,525.00	Demand	3.10	3.10	1,695.30	73.68
J-20	1,532.90	Demand	0.00	0.00	1,695.31	70.27
J-21	1,532.94	Demand	0.00	0.00	1,695.30	70.25
J-22	1,528.90	Demand	4.00	4.00	1,695.30	71.99
J-23	1,530.00	Demand	1.80	1.80	1,695.30	71.52
J-24	1,525.00	Demand	3.60	3.60	1,695.30	73.68
J-25	1,532.00	Demand	4.30	4.30	1,695.30	70.65
J-26	1,526.13	Demand	4.00	4.00	1,695.30	73.19
J-27	1,534.00	Demand	2.90	2.90	1,695.30	69.79
J-28	1,530.94	Demand	2.20	2.20	1,695.30	71.11
J-29	1,527.26	Demand	1.40	1.40	1,695.30	72.70
J-30	1,528.53	Demand	2.20	2.20	1,695.31	72.16
J-31	1,534.00	Demand	2.70	2.70	1,695.31	69.79
J-32	1,526.00	Demand	0.50	0.50	1,695.31	73.25
J-33	1,535.12	Demand	3.30	3.30	1,695.31	69.31
J-34	1,527.12	Demand	2.90	2.90	1,695.31	72.77
J-35	1,536.24	Demand	1.30	1.30	1,695.31	68.82
J-36	1,534.24	Demand	1.60	1.60	1,695.31	69.69
J-37	1,528.24	Demand	2.70	2.70	1,695.31	72.28
J-38	1,533.83	Demand	0.00	0.00	1,695.32	69.87
J-39	1,532.83	Demand	2.50	2.50	1,695.32	70.30
J-40	1,536.75	Demand	0.00	0.00	1,695.32	68.61
J-41	1,533.89	Demand	1.60	1.60	1,695.32	69.84
J-42	1,528.63	Demand	1.80	1.80	1,695.32	72.12
J-43	1,535.01	Demand	1.60	1.60	1,695.32	69.36
J-44	1,532.28	Demand	2.70	2.70	1,695.33	70.54
J-45	1,529.75	Demand	2.00	2.00	1,695.32	71.64
J-46	1,532.28	Demand	2.50	2.50	1,695.33	70.55
J-47	1,537.00	Demand	2.30	2.30	1,695.34	68.50
J-48	1,529.29	Demand	1.60	1.60	1,695.34	71.84
J-49	1,540.06	Demand	1.30	1.30	1,695.34	67.18
J-50	1,530.41	Demand	3.60	3.60	1,695.34	71.36
J-51	1,541.54	Demand	0.70	0.70	1,695.35	66.54
J-52	1,540.03	Demand	2.90	2.90	1,695.35	67.20
J-53	1,531.53	Demand	3.40	3.40	1,695.34	70.87

Scenario: Average Day Demand
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-54	1,542.37	Demand	0.00	0.00	1,695.36	66.19
J-55	1,542.30	Demand	2.70	2.70	1,695.37	66.23
J-56	1,546.95	Demand	0.00	0.00	1,695.36	64.21
J-57	1,547.00	Demand	1.40	1.40	1,695.37	64.19
J-58	1,530.09	Demand	2.50	2.50	1,695.39	71.52
J-59	1,552.60	Demand	3.40	3.40	1,695.38	61.77
J-60	1,533.24	Demand	3.30	3.30	1,695.40	70.16
J-61	1,553.85	Demand	1.10	1.10	1,695.38	61.23
J-62	1,550.92	Demand	0.90	0.90	1,695.38	62.50
J-63	1,534.37	Demand	2.00	2.00	1,695.39	69.67
J-64	1,553.49	Demand	0.00	0.00	1,695.38	61.39
J-65	1,560.21	Demand	0.00	0.00	1,695.37	58.48
J-66	1,536.24	Demand	2.30	2.30	1,695.38	68.85
J-67	1,566.04	Demand	1.40	1.40	1,695.35	55.95
J-68	1,555.37	Demand	1.60	1.60	1,695.35	60.56
J-69	1,549.96	Demand	0.70	0.70	1,695.35	62.90
J-70	1,575.94	Demand	2.20	2.20	1,695.35	51.66
J-71	1,559.91	Demand	2.30	2.30	1,695.35	58.60
J-72	1,586.00	Demand	2.20	2.20	1,695.35	47.31
J-73	1,570.00	Demand	2.00	2.00	1,695.35	54.23
J-74	1,551.03	Demand	0.00	0.00	1,695.35	62.44
J-75	1,549.49	Demand	2.00	2.00	1,695.34	63.10
J-76	1,552.01	Demand	1.10	1.10	1,695.33	62.01
J-77	1,548.53	Demand	1.80	1.80	1,695.33	63.51
J-78	1,539.94	Demand	1.60	1.60	1,695.33	67.23
J-79	1,553.51	Demand	1.80	1.80	1,695.33	61.36
J-80	1,545.90	Demand	1.10	1.10	1,695.34	64.65
J-81	1,565.87	Demand	0.00	0.00	1,695.35	56.02
J-82	1,559.48	Demand	0.00	0.00	1,695.36	58.79
J-83	1,549.45	Demand	2.70	2.70	1,695.32	63.11
J-84	1,541.24	Demand	1.60	1.60	1,695.32	66.66
J-85	1,542.55	Demand	3.10	3.10	1,695.31	66.09
J-86	1,545.58	Demand	3.10	3.10	1,695.32	64.78
J-87	1,543.13	Demand	2.20	2.20	1,695.32	65.84
J-88	1,544.25	Demand	2.00	2.00	1,695.32	65.36
J-89	1,545.37	Demand	2.00	2.00	1,695.32	64.88
J-90	1,540.98	Demand	1.10	1.10	1,695.32	66.77
J-91	1,542.01	Demand	0.90	0.90	1,695.32	66.33
J-92	1,546.10	Demand	2.30	2.30	1,695.32	64.56
J-93	1,547.22	Demand	2.30	2.30	1,695.32	64.08
J-94	1,543.00	Demand	2.30	2.30	1,695.32	65.90
J-95	1,538.70	Demand	0.00	0.00	1,695.32	67.76
J-96	1,538.07	Demand	1.60	1.60	1,695.32	68.03
J-97	1,548.50	Demand	1.40	1.40	1,695.32	63.52
J-98	1,539.19	Demand	2.90	2.90	1,695.32	67.55
J-99	1,540.36	Demand	0.00	0.00	1,695.32	67.04
J-100	1,544.05	Demand	4.00	4.00	1,695.31	65.44
J-101	1,549.13	Demand	0.90	0.90	1,695.31	63.25
J-102	1,548.00	Demand	4.00	4.00	1,695.31	63.73
J-103	1,546.73	Demand	3.10	3.10	1,695.31	64.28
J-104	1,535.33	Demand	1.60	1.60	1,695.31	69.22
J-105	1,537.75	Demand	2.30	2.30	1,695.31	68.17
J-106	1,542.00	Demand	1.40	1.40	1,695.31	66.33

Scenario: Average Day Demand
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-107	1,537.55	Demand	0.00	0.00	1,695.31	68.25
J-108	1,533.80	Demand	0.00	0.00	1,695.40	69.92
J-110	1,543.37	Demand	2.30	2.30	1,695.38	65.77
J-111	1,542.26	Demand	1.60	1.60	1,695.38	66.25
J-112	1,549.81	Demand	0.90	0.90	1,695.38	62.98
J-113	1,553.62	Demand	1.10	1.10	1,695.38	61.33
J-114	1,557.00	Demand	1.10	1.10	1,695.37	59.87
J-115	1,554.22	Demand	2.00	2.00	1,695.37	61.07
J-116	1,538.78	Demand	1.80	1.80	1,695.38	67.75
J-117	1,555.55	Demand	1.80	1.80	1,695.37	60.49
J-118	1,558.97	Demand	1.30	1.30	1,695.37	59.01
J-119	1,540.30	Demand	2.00	2.00	1,695.37	67.09
J-120	1,560.03	Demand	2.50	2.50	1,695.37	58.55
J-121	1,544.42	Demand	2.30	2.30	1,695.37	65.31
J-122	1,558.62	Demand	2.00	2.00	1,695.37	59.16
J-124	1,544.87	Demand	2.50	2.50	1,695.37	65.11
J-126	1,558.61	Demand	1.30	1.30	1,695.36	59.17
J-127	1,565.00	Demand	0.00	0.00	1,695.37	56.40
J-128	1,552.52	Demand	0.90	0.90	1,695.36	61.80
J-129	1,546.07	Demand	1.60	1.60	1,695.36	64.59
J-130	1,555.29	Demand	0.00	0.00	1,695.36	60.60
J-131	1,555.84	Demand	15.60	15.60	1,695.36	60.37
J-132	1,565.00	Demand	0.00	0.00	1,695.37	56.40
J-133	1,538.48	Demand	3.10	3.10	1,695.34	67.87

Scenario: Average Day Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	932.00	8.0	PVC	140.0	3.66	1,695.30	1,695.30	0.00	0.00
P-2	816.00	8.0	PVC	140.0	5.68	1,695.30	1,695.30	0.00	0.00
P-3	518.00	8.0	PVC	140.0	6.73	1,695.30	1,695.30	0.00	0.00
P-4	224.00	8.0	PVC	140.0	27.28	1,695.31	1,695.30	0.00	0.02
P-5	285.00	8.0	PVC	140.0	7.15	1,695.30	1,695.30	0.00	0.00
P-6	381.00	8.0	PVC	140.0	-7.26	1,695.30	1,695.30	0.00	0.00
P-7	167.00	8.0	PVC	140.0	-15.65	1,695.30	1,695.30	0.00	0.01
P-8	323.00	8.0	PVC	140.0	10.33	1,695.30	1,695.30	0.00	0.00
P-9	350.00	8.0	PVC	140.0	1.30	1,695.30	1,695.30	0.00	0.00
P-10	155.00	8.0	PVC	140.0	0.26	1,695.30	1,695.30	0.00	0.00
P-11	125.00	8.0	PVC	140.0	-7.29	1,695.30	1,695.30	0.00	0.00
P-12	280.00	8.0	PVC	140.0	-5.01	1,695.30	1,695.30	0.00	0.00
P-13	897.00	8.0	PVC	140.0	2.28	1,695.30	1,695.30	0.00	0.00
P-14	176.00	8.0	PVC	140.0	0.00	1,695.30	1,695.30	0.00	0.00
P-15	897.00	8.0	PVC	140.0	3.16	1,695.30	1,695.30	0.00	0.00
P-16	160.00	8.0	PVC	140.0	-0.08	1,695.30	1,695.30	0.00	0.00
P-17	125.00	8.0	PVC	140.0	13.25	1,695.30	1,695.30	0.00	0.00
P-18	897.00	8.0	PVC	140.0	4.36	1,695.30	1,695.30	0.00	0.00
P-19	155.00	8.0	PVC	140.0	-5.68	1,695.30	1,695.30	0.00	0.00
P-20	125.00	8.0	PVC	140.0	1.07	1,695.30	1,695.30	0.00	0.00
P-21	280.00	8.0	PVC	140.0	-5.49	1,695.30	1,695.30	0.00	0.00
P-22	280.00	8.0	PVC	140.0	-1.02	1,695.30	1,695.30	0.00	0.00
P-23	280.00	8.0	PVC	140.0	-1.26	1,695.30	1,695.30	0.00	0.00
P-24	550.00	8.0	PVC	140.0	21.24	1,695.31	1,695.30	0.01	0.01
P-25	313.00	8.0	PVC	140.0	13.72	1,695.30	1,695.30	0.00	0.01
P-26	205.00	8.0	PVC	140.0	7.52	1,695.30	1,695.30	0.00	0.00
P-27	265.00	8.0	PVC	140.0	-1.99	1,695.30	1,695.30	0.00	0.00
P-28	831.00	8.0	PVC	140.0	1.53	1,695.30	1,695.30	0.00	0.00
P-29	897.00	8.0	PVC	140.0	-0.48	1,695.30	1,695.30	0.00	0.00
P-30	498.00	8.0	PVC	140.0	-6.53	1,695.30	1,695.30	0.00	0.00
P-31	208.00	8.0	PVC	140.0	7.95	1,695.30	1,695.30	0.00	0.00
P-32	284.00	8.0	PVC	140.0	0.19	1,695.30	1,695.30	0.00	0.00
P-33	273.00	8.0	PVC	140.0	-3.63	1,695.30	1,695.30	0.00	0.00
P-34	282.00	8.0	PVC	140.0	-2.07	1,695.30	1,695.30	0.00	0.00
P-35	282.00	8.0	PVC	140.0	-6.55	1,695.30	1,695.30	0.00	0.00
P-36	353.00	8.0	PVC	140.0	-16.68	1,695.30	1,695.31	0.00	0.01
P-37	454.00	8.0	PVC	140.0	7.75	1,695.31	1,695.31	0.00	0.00
P-38	126.00	8.0	PVC	140.0	-11.13	1,695.31	1,695.31	0.00	0.00
P-39	581.00	8.0	PVC	140.0	3.00	1,695.31	1,695.31	0.00	0.00
P-40	151.00	8.0	PVC	140.0	-18.04	1,695.31	1,695.31	0.00	0.01
P-41	436.00	8.0	PVC	140.0	14.24	1,695.31	1,695.31	0.00	0.01
P-42	280.00	8.0	PVC	140.0	-10.45	1,695.31	1,695.31	0.00	0.00
P-43	266.00	8.0	PVC	140.0	-16.74	1,695.31	1,695.31	0.00	0.01
P-44	280.00	8.0	PVC	140.0	-11.63	1,695.31	1,695.31	0.00	0.00
P-45	280.00	8.0	PVC	140.0	-11.54	1,695.31	1,695.31	0.00	0.00
P-46	284.00	8.0	PVC	140.0	-33.88	1,695.31	1,695.32	0.01	0.03
P-47	184.00	8.0	PVC	140.0	-18.68	1,695.32	1,695.32	0.00	0.01
P-48	455.00	8.0	PVC	140.0	15.20	1,695.32	1,695.32	0.00	0.01
P-49	265.00	8.0	PVC	140.0	10.99	1,695.32	1,695.32	0.00	0.00
P-50	395.00	8.0	PVC	140.0	-10.19	1,695.32	1,695.32	0.00	0.00
P-51	349.00	8.0	PVC	140.0	-14.19	1,695.32	1,695.33	0.00	0.01
P-52	317.00	8.0	PVC	140.0	13.99	1,695.33	1,695.32	0.00	0.01

Scenario: Average Day Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-53	266.00	8.0	PVC	140.0	-12.59	1,695.32	1,695.32	0.00	0.00
P-54	280.00	8.0	PVC	140.0	-11.99	1,695.32	1,695.32	0.00	0.00
P-55	280.00	8.0	PVC	140.0	-30.88	1,695.33	1,695.33	0.01	0.03
P-56	429.00	8.0	PVC	140.0	15.17	1,695.34	1,695.33	0.00	0.01
P-57	272.00	8.0	PVC	140.0	-18.21	1,695.33	1,695.34	0.00	0.01
P-58	838.00	8.0	PVC	140.0	6.86	1,695.34	1,695.34	0.00	0.00
P-59	132.00	8.0	PVC	140.0	-29.43	1,695.35	1,695.35	0.00	0.02
P-60	712.00	8.0	PVC	140.0	19.95	1,695.35	1,695.34	0.01	0.01
P-61	266.00	8.0	PVC	140.0	-28.73	1,695.34	1,695.35	0.01	0.02
P-62	280.00	8.0	PVC	140.0	-19.81	1,695.34	1,695.34	0.00	0.01
P-63	280.00	8.0	PVC	140.0	-16.55	1,695.34	1,695.34	0.00	0.01
P-64	177.00	8.0	PVC	140.0	-52.28	1,695.35	1,695.36	0.01	0.07
P-65	215.00	12.0	PVC	140.0	-114.82	1,695.36	1,695.37	0.01	0.04
P-66	457.00	12.0	PVC	140.0	-62.54	1,695.36	1,695.36	0.01	0.01
P-67	261.00	8.0	PVC	140.0	22.15	1,695.37	1,695.37	0.00	0.01
P-68	689.00	12.0	PVC	140.0	-95.38	1,695.37	1,695.39	0.02	0.03
P-69	897.00	8.0	PVC	140.0	-29.12	1,695.38	1,695.40	0.02	0.02
P-70	146.00	8.0	PVC	140.0	1.07	1,695.38	1,695.38	0.00	0.00
P-71	280.00	8.0	PVC	140.0	-23.55	1,695.37	1,695.38	0.00	0.02
P-72	280.00	8.0	PVC	140.0	2.17	1,695.38	1,695.38	0.00	0.00
P-73	292.00	12.0	PVC	140.0	-97.88	1,695.39	1,695.40	0.01	0.03
P-74	190.00	12.0	PVC	140.0	70.03	1,695.38	1,695.38	0.00	0.02
P-75	411.00	12.0	PVC	140.0	81.69	1,695.38	1,695.37	0.01	0.02
P-76	468.00	8.0	PVC	140.0	30.29	1,695.39	1,695.38	0.01	0.02
P-77	392.00	8.0	PVC	140.0	7.74	1,695.35	1,695.35	0.00	0.00
P-78	199.00	8.0	PVC	140.0	-11.11	1,695.35	1,695.35	0.00	0.00
P-79	591.00	8.0	PVC	140.0	-4.81	1,695.35	1,695.35	0.00	0.00
P-80	597.00	8.0	PVC	140.0	-8.73	1,695.35	1,695.35	0.00	0.00
P-81	300.00	8.0	PVC	140.0	-9.14	1,695.35	1,695.35	0.00	0.00
P-82	291.00	8.0	PVC	140.0	-6.53	1,695.35	1,695.35	0.00	0.00
P-83	300.00	8.0	PVC	140.0	-11.81	1,695.35	1,695.35	0.00	0.00
P-84	217.00	8.0	PVC	140.0	17.25	1,695.35	1,695.35	0.00	0.01
P-85	230.00	8.0	PVC	140.0	40.02	1,695.35	1,695.34	0.01	0.04
P-86	520.00	8.0	PVC	140.0	-22.77	1,695.35	1,695.36	0.01	0.01
P-87	232.00	8.0	PVC	140.0	17.22	1,695.33	1,695.33	0.00	0.01
P-88	530.00	8.0	PVC	140.0	-15.21	1,695.33	1,695.33	0.00	0.01
P-89	408.00	8.0	PVC	140.0	-20.12	1,695.33	1,695.34	0.00	0.01
P-90	360.00	8.0	PVC	140.0	17.91	1,695.34	1,695.34	0.00	0.01
P-91	276.00	8.0	PVC	140.0	-18.32	1,695.33	1,695.33	0.00	0.01
P-92	290.00	8.0	PVC	140.0	-16.81	1,695.33	1,695.34	0.00	0.01
P-93	180.00	8.0	PVC	140.0	-18.92	1,695.35	1,695.35	0.00	0.01
P-94	125.00	8.0	PVC	140.0	10.73	1,695.35	1,695.35	0.00	0.00
P-95	247.00	8.0	PVC	140.0	-29.65	1,695.35	1,695.36	0.01	0.02
P-96	285.00	8.0	PVC	140.0	30.62	1,695.33	1,695.32	0.01	0.02
P-97	327.00	8.0	PVC	140.0	12.21	1,695.32	1,695.31	0.00	0.00
P-98	758.00	8.0	PVC	140.0	-8.13	1,695.31	1,695.32	0.00	0.00
P-99	280.00	8.0	PVC	140.0	-7.37	1,695.32	1,695.32	0.00	0.00
P-100	280.00	8.0	PVC	140.0	-4.48	1,695.32	1,695.32	0.00	0.00
P-101	267.00	8.0	PVC	140.0	-2.56	1,695.32	1,695.32	0.00	0.00
P-102	258.00	8.0	PVC	140.0	12.13	1,695.32	1,695.32	0.00	0.00
P-103	280.00	8.0	PVC	140.0	4.64	1,695.32	1,695.32	0.00	0.00
P-104	280.00	8.0	PVC	140.0	-2.55	1,695.32	1,695.32	0.00	0.00

Scenario: Average Day Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-105	267.00	8.0	PVC	140.0	-8.77	1,695.32	1,695.32	0.00	0.00
P-106	125.00	8.0	PVC	140.0	-6.45	1,695.32	1,695.32	0.00	0.00
P-107	243.00	8.0	PVC	140.0	-16.98	1,695.32	1,695.32	0.00	0.01
P-108	715.00	8.0	PVC	140.0	10.95	1,695.32	1,695.32	0.00	0.00
P-109	290.00	8.0	PVC	140.0	-13.81	1,695.32	1,695.32	0.00	0.01
P-110	457.00	8.0	PVC	140.0	-8.64	1,695.32	1,695.32	0.00	0.00
P-111	266.00	8.0	PVC	140.0	-15.58	1,695.32	1,695.32	0.00	0.01
P-112	457.00	8.0	PVC	140.0	-4.89	1,695.32	1,695.32	0.00	0.00
P-113	457.00	8.0	PVC	140.0	-3.92	1,695.32	1,695.32	0.00	0.00
P-114	125.00	8.0	PVC	140.0	-15.79	1,695.32	1,695.32	0.00	0.01
P-115	332.00	8.0	PVC	140.0	2.33	1,695.32	1,695.32	0.00	0.00
P-116	484.00	8.0	PVC	140.0	-18.12	1,695.32	1,695.32	0.00	0.01
P-117	295.00	8.0	PVC	140.0	17.24	1,695.31	1,695.31	0.00	0.01
P-118	294.00	8.0	PVC	140.0	-0.90	1,695.31	1,695.31	0.00	0.00
P-119	1,110.00	8.0	PVC	140.0	-6.26	1,695.31	1,695.31	0.00	0.00
P-120	674.00	8.0	PVC	140.0	6.98	1,695.31	1,695.31	0.00	0.00
P-121	668.00	8.0	PVC	140.0	3.88	1,695.31	1,695.31	0.00	0.00
P-122	230.00	8.0	PVC	140.0	2.34	1,695.31	1,695.31	0.00	0.00
P-123	480.00	8.0	PVC	140.0	-1.36	1,695.31	1,695.31	0.00	0.00
P-124	513.00	8.0	PVC	140.0	-1.40	1,695.31	1,695.31	0.00	0.00
P-125	217.00	8.0	PVC	140.0	-0.06	1,695.31	1,695.31	0.00	0.00
P-126	865.00	12.0	PVC	140.0	0.00	1,695.31	1,695.31	0.00	0.00
P-127	847.00	12.0	PVC	140.0	-27.28	1,695.31	1,695.31	0.00	0.00
P-128	1,645.00	12.0	PVC	140.0	-48.58	1,695.31	1,695.32	0.01	0.01
P-129	1,501.00	12.0	PVC	140.0	-81.90	1,695.32	1,695.36	0.03	0.02
P-130	650.00	12.0	PVC	140.0	-42.13	1,695.36	1,695.36	0.00	0.01
P-131	387.00	12.0	PVC	140.0	-71.78	1,695.36	1,695.37	0.01	0.02
P-132	71.00	12.0	PVC	140.0	-130.30	1,695.40	1,695.40	0.00	0.05
P-133	227.00	12.0	PVC	140.0	120.50	1,695.40	1,695.39	0.01	0.04
P-134	47.00	8.0	PVC	140.0	-250.80	1,695.40	1,695.46	0.06	1.23
P-135	302.00	12.0	PVC	140.0	-69.86	1,695.38	1,695.38	0.00	0.02
P-136	378.00	12.0	PVC	140.0	-88.21	1,695.38	1,695.39	0.01	0.02
P-137	388.00	8.0	PVC	140.0	16.06	1,695.38	1,695.38	0.00	0.01
P-138	185.00	8.0	PVC	140.0	-11.66	1,695.38	1,695.38	0.00	0.00
P-139	190.00	8.0	PVC	140.0	-11.19	1,695.38	1,695.38	0.00	0.00
P-140	267.00	8.0	PVC	140.0	-23.75	1,695.38	1,695.38	0.00	0.02
P-141	281.00	8.0	PVC	140.0	-9.29	1,695.38	1,695.38	0.00	0.00
P-142	145.00	8.0	PVC	140.0	8.99	1,695.37	1,695.37	0.00	0.00
P-143	491.00	8.0	PVC	140.0	-16.90	1,695.37	1,695.38	0.00	0.01
P-144	282.00	8.0	PVC	140.0	-18.70	1,695.38	1,695.38	0.00	0.01
P-145	268.00	8.0	PVC	140.0	-10.09	1,695.37	1,695.38	0.00	0.00
P-146	280.00	8.0	PVC	140.0	23.89	1,695.37	1,695.37	0.00	0.02
P-147	171.00	6.0	PVC	140.0	-8.43	1,695.37	1,695.37	0.00	0.01
P-148	366.00	8.0	PVC	140.0	13.66	1,695.37	1,695.37	0.00	0.01
P-149	441.00	6.0	PVC	140.0	-0.10	1,695.37	1,695.37	0.00	0.00
P-150	306.00	6.0	PVC	140.0	-4.73	1,695.37	1,695.37	0.00	0.00
P-151	262.00	6.0	PVC	140.0	-7.13	1,695.37	1,695.37	0.00	0.01
P-152	352.00	8.0	PVC	140.0	-9.26	1,695.37	1,695.37	0.00	0.00
P-153	317.00	8.0	PVC	140.0	-11.66	1,695.37	1,695.37	0.00	0.00
P-163	1,664.00	12.0	PVC	140.0	9.91	1,695.37	1,695.37	0.00	0.00
P-164	280.00	8.0	PVC	140.0	8.05	1,695.32	1,695.32	0.00	0.00
P-165	290.00	8.0	PVC	140.0	11.23	1,695.32	1,695.32	0.00	0.00

Scenario: Average Day Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-166	280.00	8.0	PVC	140.0	-17.47	1,695.34	1,695.34	0.00	0.01
P-167	137.00	8.0	PVC	140.0	-20.57	1,695.34	1,695.34	0.00	0.01
P-154	376.00	6.0	PVC	140.0	-0.56	1,695.37	1,695.37	0.00	0.00
P-155	187.00	8.0	PVC	140.0	-4.60	1,695.36	1,695.36	0.00	0.00
P-156	321.00	8.0	PVC	140.0	-6.20	1,695.36	1,695.37	0.00	0.00
P-157	255.00	6.0	PVC	140.0	-3.29	1,695.36	1,695.37	0.00	0.00
P-158	184.00	6.0	PVC	140.0	1.99	1,695.36	1,695.36	0.00	0.00
P-159	410.00	8.0	PVC	140.0	9.91	1,695.37	1,695.36	0.00	0.00
P-160	222.00	8.0	PVC	140.0	-5.69	1,695.36	1,695.36	0.00	0.00
P-161	771.00	12.0	PVC	140.0	0.00	1,695.37	1,695.37	0.00	0.00
P-162	62.00	8.0	PVC	140.0	-15.60	1,695.36	1,695.36	0.00	0.01

Scenario: Max Day Demand
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	1,536.00	Demand	7.20	14.40	1,693.39	68.10
J-2	1,531.97	Demand	6.80	13.60	1,693.39	69.84
J-3	1,539.64	Demand	5.40	10.80	1,693.40	66.52
J-4	1,530.85	Demand	6.80	13.60	1,693.39	70.32
J-5	1,535.50	Demand	4.60	9.20	1,693.40	68.32
J-6	1,529.73	Demand	3.60	7.20	1,693.39	70.81
J-7	1,540.40	Demand	0.00	0.00	1,693.47	66.23
J-8	1,538.98	Demand	2.60	5.20	1,693.42	66.82
J-9	1,531.35	Demand	0.80	1.60	1,693.39	70.11
J-10	1,530.21	Demand	0.80	1.60	1,693.38	70.60
J-11	1,530.37	Demand	2.60	5.20	1,693.40	70.54
J-12	1,530.83	Demand	6.80	13.60	1,693.38	70.33
J-13	1,525.46	Demand	6.60	13.20	1,693.37	72.65
J-14	1,525.00	Demand	0.00	0.00	1,693.37	72.85
J-15	1,528.99	Demand	6.80	13.60	1,693.38	71.12
J-16	1,526.12	Demand	6.80	13.60	1,693.37	72.36
J-17	1,529.09	Demand	0.80	1.60	1,693.39	71.09
J-18	1,528.59	Demand	6.80	13.60	1,693.38	71.30
J-19	1,525.00	Demand	6.20	12.40	1,693.38	72.85
J-20	1,532.90	Demand	0.00	0.00	1,693.51	69.49
J-21	1,532.94	Demand	0.00	0.00	1,693.41	69.43
J-22	1,528.90	Demand	8.00	16.00	1,693.41	71.18
J-23	1,530.00	Demand	3.60	7.20	1,693.41	70.70
J-24	1,525.00	Demand	7.20	14.40	1,693.41	72.86
J-25	1,532.00	Demand	8.60	17.20	1,693.41	69.83
J-26	1,526.13	Demand	8.00	16.00	1,693.41	72.37
J-27	1,534.00	Demand	5.80	11.60	1,693.41	68.97
J-28	1,530.94	Demand	4.40	8.80	1,693.42	70.30
J-29	1,527.26	Demand	2.80	5.60	1,693.41	71.89
J-30	1,528.53	Demand	4.40	8.80	1,693.46	71.36
J-31	1,534.00	Demand	5.40	10.80	1,693.47	68.99
J-32	1,526.00	Demand	1.00	2.00	1,693.46	72.45
J-33	1,535.12	Demand	6.60	13.20	1,693.48	68.52
J-34	1,527.12	Demand	5.80	11.60	1,693.48	71.98
J-35	1,536.24	Demand	2.60	5.20	1,693.51	68.04
J-36	1,534.24	Demand	3.20	6.40	1,693.53	68.92
J-37	1,528.24	Demand	5.40	10.80	1,693.49	71.50
J-38	1,533.83	Demand	0.00	0.00	1,693.64	69.14
J-39	1,532.83	Demand	5.00	10.00	1,693.66	69.59
J-40	1,536.75	Demand	0.00	0.00	1,693.68	67.90
J-41	1,533.89	Demand	3.20	6.40	1,693.68	69.13
J-42	1,528.63	Demand	3.60	7.20	1,693.68	71.41
J-43	1,535.01	Demand	3.20	6.40	1,693.69	68.65
J-44	1,532.28	Demand	5.40	10.80	1,693.72	69.85
J-45	1,529.75	Demand	4.00	8.00	1,693.70	70.93
J-46	1,532.28	Demand	5.00	10.00	1,693.81	69.89
J-47	1,537.00	Demand	4.60	9.20	1,693.85	67.86
J-48	1,529.29	Demand	3.20	6.40	1,693.85	71.20
J-49	1,540.06	Demand	2.60	5.20	1,693.91	66.56
J-50	1,530.41	Demand	7.20	14.40	1,693.89	70.73
J-51	1,541.54	Demand	1.40	2.80	1,693.98	65.95
J-52	1,540.03	Demand	5.80	11.60	1,694.02	66.63
J-53	1,531.53	Demand	6.80	13.60	1,693.92	70.26

Scenario: Max Day Demand
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-54	1,542.37	Demand	0.00	0.00	1,694.18	65.68
J-55	1,542.30	Demand	5.40	10.80	1,694.29	65.76
J-56	1,546.95	Demand	0.00	0.00	1,694.10	63.66
J-57	1,547.00	Demand	2.80	5.60	1,694.34	63.75
J-58	1,530.09	Demand	5.00	10.00	1,694.55	71.15
J-59	1,552.60	Demand	6.80	13.60	1,694.39	61.35
J-60	1,533.24	Demand	6.60	13.20	1,694.66	69.84
J-61	1,553.85	Demand	2.20	4.40	1,694.39	60.81
J-62	1,550.92	Demand	1.80	3.60	1,694.39	62.07
J-63	1,534.37	Demand	4.00	8.00	1,694.58	69.31
J-64	1,553.49	Demand	0.00	0.00	1,694.35	60.94
J-65	1,560.21	Demand	0.00	0.00	1,694.24	57.99
J-66	1,536.24	Demand	4.60	9.20	1,694.43	68.44
J-67	1,566.04	Demand	2.80	5.60	1,694.04	55.38
J-68	1,555.37	Demand	3.20	6.40	1,694.03	59.99
J-69	1,549.96	Demand	1.40	2.80	1,694.04	62.34
J-70	1,575.94	Demand	4.40	8.80	1,694.05	51.10
J-71	1,559.91	Demand	4.60	9.20	1,694.05	58.04
J-72	1,586.00	Demand	4.40	8.80	1,694.05	46.75
J-73	1,570.00	Demand	4.00	8.00	1,694.07	53.68
J-74	1,551.03	Demand	0.00	0.00	1,694.00	61.86
J-75	1,549.49	Demand	4.00	8.00	1,693.88	62.47
J-76	1,552.01	Demand	2.20	4.40	1,693.78	61.34
J-77	1,548.53	Demand	3.60	7.20	1,693.76	62.83
J-78	1,539.94	Demand	3.20	6.40	1,693.80	66.57
J-79	1,553.51	Demand	3.60	7.20	1,693.82	60.70
J-80	1,545.90	Demand	2.20	4.40	1,693.84	64.00
J-81	1,565.87	Demand	0.00	0.00	1,694.08	55.47
J-82	1,559.48	Demand	0.00	0.00	1,694.15	58.27
J-83	1,549.45	Demand	5.40	10.80	1,693.66	62.39
J-84	1,541.24	Demand	3.20	6.40	1,693.58	65.91
J-85	1,542.55	Demand	6.20	12.40	1,693.56	65.33
J-86	1,545.58	Demand	6.20	12.40	1,693.58	64.03
J-87	1,543.13	Demand	4.40	8.80	1,693.60	65.10
J-88	1,544.25	Demand	4.00	8.00	1,693.61	64.62
J-89	1,545.37	Demand	4.00	8.00	1,693.61	64.14
J-90	1,540.98	Demand	2.20	4.40	1,693.61	66.04
J-91	1,542.01	Demand	1.80	3.60	1,693.59	65.58
J-92	1,546.10	Demand	4.60	9.20	1,693.61	63.82
J-93	1,547.22	Demand	4.60	9.20	1,693.61	63.34
J-94	1,543.00	Demand	4.60	9.20	1,693.61	65.16
J-95	1,538.70	Demand	0.00	0.00	1,693.62	67.03
J-96	1,538.07	Demand	3.20	6.40	1,693.62	67.30
J-97	1,548.50	Demand	2.80	5.60	1,693.64	62.79
J-98	1,539.19	Demand	5.80	11.60	1,693.63	66.82
J-99	1,540.36	Demand	0.00	0.00	1,693.62	66.31
J-100	1,544.05	Demand	8.00	16.00	1,693.52	64.67
J-101	1,549.13	Demand	1.80	3.60	1,693.51	62.46
J-102	1,548.00	Demand	8.00	16.00	1,693.51	62.95
J-103	1,546.73	Demand	6.20	12.40	1,693.51	63.50
J-104	1,535.33	Demand	3.20	6.40	1,693.51	68.44
J-105	1,537.75	Demand	4.60	9.20	1,693.51	67.39
J-106	1,542.00	Demand	2.80	5.60	1,693.50	65.55

Scenario: Max Day Demand
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-107	1,537.55	Demand	0.00	0.00	1,693.47	67.46
J-108	1,533.80	Demand	0.00	0.00	1,694.71	69.62
J-110	1,543.37	Demand	4.60	9.20	1,694.46	65.37
J-111	1,542.26	Demand	3.20	6.40	1,694.42	65.83
J-112	1,549.81	Demand	1.80	3.60	1,694.36	62.54
J-113	1,553.62	Demand	2.20	4.40	1,694.35	60.89
J-114	1,557.00	Demand	2.20	4.40	1,694.34	59.42
J-115	1,554.22	Demand	4.00	8.00	1,694.34	60.62
J-116	1,538.78	Demand	3.60	7.20	1,694.39	67.33
J-117	1,555.55	Demand	3.60	7.20	1,694.28	60.02
J-118	1,558.97	Demand	2.50	5.00	1,694.26	58.53
J-119	1,540.30	Demand	4.00	8.00	1,694.25	66.61
J-120	1,560.03	Demand	5.10	10.20	1,694.23	58.06
J-121	1,544.42	Demand	4.70	9.40	1,694.23	64.82
J-122	1,558.62	Demand	4.00	8.00	1,694.22	58.67
J-124	1,544.87	Demand	5.10	10.20	1,694.22	64.62
J-127	1,565.00	Demand	0.00	0.00	1,694.23	55.91
J-132	1,565.00	Demand	0.00	0.00	1,694.23	55.91
J-133	1,538.48	Demand	6.10	12.20	1,693.88	67.24
J-126	1,558.61	Demand	2.50	5.00	1,694.22	58.67
J-128	1,552.52	Demand	1.80	3.60	1,694.21	61.30
J-129	1,546.07	Demand	3.30	6.60	1,694.22	64.10
J-130	1,555.29	Demand	0.00	0.00	1,694.21	60.10
J-131	1,555.84	Demand	31.30	62.60	1,694.21	59.86

Scenario: Max Day Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	932.00	8.0	PVC	140.0	14.66	1,693.39	1,693.39	0.01	0.01
P-2	816.00	8.0	PVC	140.0	22.73	1,693.40	1,693.39	0.01	0.01
P-3	518.00	8.0	PVC	140.0	26.91	1,693.40	1,693.39	0.01	0.02
P-4	224.00	8.0	PVC	140.0	109.11	1,693.47	1,693.42	0.06	0.26
P-5	285.00	8.0	PVC	140.0	28.61	1,693.39	1,693.38	0.01	0.02
P-6	381.00	8.0	PVC	140.0	-29.06	1,693.39	1,693.40	0.01	0.02
P-7	167.00	8.0	PVC	140.0	-62.59	1,693.40	1,693.42	0.02	0.09
P-8	323.00	8.0	PVC	140.0	41.31	1,693.42	1,693.40	0.01	0.04
P-9	350.00	8.0	PVC	140.0	5.20	1,693.40	1,693.40	0.00	0.00
P-10	155.00	8.0	PVC	140.0	1.06	1,693.39	1,693.39	0.00	0.00
P-11	125.00	8.0	PVC	140.0	-29.16	1,693.39	1,693.39	0.00	0.02
P-12	280.00	8.0	PVC	140.0	-20.02	1,693.39	1,693.39	0.00	0.01
P-13	897.00	8.0	PVC	140.0	9.12	1,693.38	1,693.37	0.00	0.00
P-14	176.00	8.0	PVC	140.0	0.00	1,693.37	1,693.37	0.00	0.00
P-15	897.00	8.0	PVC	140.0	12.65	1,693.38	1,693.37	0.00	0.00
P-16	160.00	8.0	PVC	140.0	-0.31	1,693.39	1,693.39	0.00	0.00
P-17	125.00	8.0	PVC	140.0	52.99	1,693.39	1,693.38	0.01	0.07
P-18	897.00	8.0	PVC	140.0	17.43	1,693.38	1,693.38	0.01	0.01
P-19	155.00	8.0	PVC	140.0	-22.72	1,693.38	1,693.38	0.00	0.01
P-20	125.00	8.0	PVC	140.0	4.29	1,693.38	1,693.38	0.00	0.00
P-21	280.00	8.0	PVC	140.0	-21.96	1,693.38	1,693.38	0.00	0.01
P-22	280.00	8.0	PVC	140.0	-4.08	1,693.37	1,693.37	0.00	0.00
P-23	280.00	8.0	PVC	140.0	-5.03	1,693.37	1,693.38	0.00	0.00
P-24	550.00	8.0	PVC	140.0	84.96	1,693.51	1,693.41	0.09	0.17
P-25	313.00	8.0	PVC	140.0	54.89	1,693.41	1,693.39	0.02	0.07
P-26	205.00	8.0	PVC	140.0	30.06	1,693.41	1,693.41	0.00	0.02
P-27	265.00	8.0	PVC	140.0	-7.95	1,693.41	1,693.41	0.00	0.00
P-28	831.00	8.0	PVC	140.0	6.11	1,693.41	1,693.41	0.00	0.00
P-29	897.00	8.0	PVC	140.0	-1.92	1,693.41	1,693.41	0.00	0.00
P-30	498.00	8.0	PVC	140.0	-26.13	1,693.41	1,693.42	0.01	0.02
P-31	208.00	8.0	PVC	140.0	31.81	1,693.42	1,693.41	0.01	0.03
P-32	284.00	8.0	PVC	140.0	0.75	1,693.41	1,693.41	0.00	0.00
P-33	273.00	8.0	PVC	140.0	-14.53	1,693.41	1,693.41	0.00	0.01
P-34	282.00	8.0	PVC	140.0	-8.29	1,693.41	1,693.41	0.00	0.00
P-35	282.00	8.0	PVC	140.0	-26.21	1,693.41	1,693.41	0.01	0.02
P-36	353.00	8.0	PVC	140.0	-66.74	1,693.42	1,693.46	0.04	0.11
P-37	454.00	8.0	PVC	140.0	31.00	1,693.47	1,693.46	0.01	0.03
P-38	126.00	8.0	PVC	140.0	-44.54	1,693.46	1,693.46	0.01	0.05
P-39	581.00	8.0	PVC	140.0	11.99	1,693.48	1,693.48	0.00	0.00
P-40	151.00	8.0	PVC	140.0	-72.18	1,693.51	1,693.53	0.02	0.12
P-41	436.00	8.0	PVC	140.0	56.96	1,693.53	1,693.49	0.03	0.08
P-42	280.00	8.0	PVC	140.0	-41.80	1,693.47	1,693.48	0.01	0.04
P-43	266.00	8.0	PVC	140.0	-66.98	1,693.48	1,693.51	0.03	0.11
P-44	280.00	8.0	PVC	140.0	-46.54	1,693.46	1,693.48	0.02	0.05
P-45	280.00	8.0	PVC	140.0	-46.16	1,693.48	1,693.49	0.01	0.05
P-46	284.00	8.0	PVC	140.0	-135.54	1,693.53	1,693.64	0.11	0.39
P-47	184.00	8.0	PVC	140.0	-74.79	1,693.64	1,693.66	0.02	0.13
P-48	455.00	8.0	PVC	140.0	60.75	1,693.68	1,693.64	0.04	0.09
P-49	265.00	8.0	PVC	140.0	44.00	1,693.68	1,693.66	0.01	0.05
P-50	395.00	8.0	PVC	140.0	-40.79	1,693.66	1,693.68	0.02	0.04
P-51	349.00	8.0	PVC	140.0	-56.80	1,693.69	1,693.72	0.03	0.08
P-52	317.00	8.0	PVC	140.0	55.99	1,693.72	1,693.70	0.02	0.08

Scenario: Max Day Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-53	266.00	8.0	PVC	140.0	-50.40	1,693.68	1,693.69	0.02	0.06
P-54	280.00	8.0	PVC	140.0	-47.99	1,693.68	1,693.70	0.02	0.06
P-55	280.00	8.0	PVC	140.0	-123.59	1,693.72	1,693.81	0.09	0.33
P-56	429.00	8.0	PVC	140.0	60.74	1,693.85	1,693.81	0.04	0.09
P-57	272.00	8.0	PVC	140.0	-72.85	1,693.81	1,693.85	0.03	0.12
P-58	838.00	8.0	PVC	140.0	27.49	1,693.91	1,693.89	0.02	0.02
P-59	132.00	8.0	PVC	140.0	-117.63	1,693.98	1,694.02	0.04	0.30
P-60	712.00	8.0	PVC	140.0	79.76	1,694.02	1,693.92	0.10	0.15
P-61	266.00	8.0	PVC	140.0	-114.83	1,693.91	1,693.98	0.08	0.29
P-62	280.00	8.0	PVC	140.0	-79.25	1,693.85	1,693.89	0.04	0.15
P-63	280.00	8.0	PVC	140.0	-66.16	1,693.89	1,693.92	0.03	0.10
P-64	177.00	8.0	PVC	140.0	-208.99	1,694.02	1,694.18	0.16	0.88
P-65	215.00	12.0	PVC	140.0	-459.31	1,694.18	1,694.29	0.11	0.52
P-66	457.00	12.0	PVC	140.0	-250.32	1,694.10	1,694.18	0.08	0.17
P-67	261.00	8.0	PVC	140.0	88.53	1,694.34	1,694.29	0.05	0.18
P-68	689.00	12.0	PVC	140.0	-381.58	1,694.29	1,694.55	0.26	0.37
P-69	897.00	8.0	PVC	140.0	-116.53	1,694.39	1,694.66	0.27	0.30
P-70	146.00	8.0	PVC	140.0	4.41	1,694.39	1,694.39	0.00	0.00
P-71	280.00	8.0	PVC	140.0	-94.13	1,694.34	1,694.39	0.06	0.20
P-72	280.00	8.0	PVC	140.0	8.81	1,694.39	1,694.39	0.00	0.00
P-73	292.00	12.0	PVC	140.0	-391.58	1,694.55	1,694.66	0.11	0.39
P-74	190.00	12.0	PVC	140.0	280.36	1,694.39	1,694.35	0.04	0.21
P-75	411.00	12.0	PVC	140.0	326.92	1,694.35	1,694.24	0.11	0.28
P-76	468.00	8.0	PVC	140.0	121.25	1,694.58	1,694.43	0.15	0.32
P-77	392.00	8.0	PVC	140.0	30.94	1,694.04	1,694.03	0.01	0.03
P-78	199.00	8.0	PVC	140.0	-44.43	1,694.03	1,694.04	0.01	0.05
P-79	591.00	8.0	PVC	140.0	-19.24	1,694.05	1,694.05	0.01	0.01
P-80	597.00	8.0	PVC	140.0	-34.91	1,694.05	1,694.07	0.02	0.03
P-81	300.00	8.0	PVC	140.0	-36.54	1,694.04	1,694.05	0.01	0.03
P-82	291.00	8.0	PVC	140.0	-26.11	1,694.05	1,694.05	0.01	0.02
P-83	300.00	8.0	PVC	140.0	-47.23	1,694.04	1,694.05	0.02	0.06
P-84	217.00	8.0	PVC	140.0	68.97	1,694.03	1,694.00	0.02	0.11
P-85	230.00	8.0	PVC	140.0	160.07	1,694.00	1,693.88	0.12	0.53
P-86	520.00	8.0	PVC	140.0	-91.10	1,694.00	1,694.10	0.10	0.19
P-87	232.00	8.0	PVC	140.0	68.85	1,693.78	1,693.76	0.03	0.11
P-88	530.00	8.0	PVC	140.0	-60.82	1,693.76	1,693.80	0.05	0.09
P-89	408.00	8.0	PVC	140.0	-80.45	1,693.82	1,693.88	0.06	0.15
P-90	360.00	8.0	PVC	140.0	71.62	1,693.88	1,693.84	0.04	0.12
P-91	276.00	8.0	PVC	140.0	-73.25	1,693.78	1,693.82	0.03	0.13
P-92	290.00	8.0	PVC	140.0	-67.22	1,693.80	1,693.84	0.03	0.11
P-93	180.00	8.0	PVC	140.0	-75.66	1,694.05	1,694.08	0.02	0.13
P-94	125.00	8.0	PVC	140.0	42.91	1,694.08	1,694.07	0.01	0.05
P-95	247.00	8.0	PVC	140.0	-118.57	1,694.08	1,694.15	0.08	0.31
P-96	285.00	8.0	PVC	140.0	122.47	1,693.76	1,693.66	0.09	0.33
P-97	327.00	8.0	PVC	140.0	48.84	1,693.58	1,693.56	0.02	0.06
P-98	758.00	8.0	PVC	140.0	-32.51	1,693.56	1,693.58	0.02	0.03
P-99	280.00	8.0	PVC	140.0	-29.50	1,693.60	1,693.61	0.01	0.02
P-100	280.00	8.0	PVC	140.0	-17.92	1,693.61	1,693.61	0.00	0.01
P-101	267.00	8.0	PVC	140.0	-10.24	1,693.61	1,693.61	0.00	0.00
P-102	258.00	8.0	PVC	140.0	48.51	1,693.61	1,693.59	0.02	0.06
P-103	280.00	8.0	PVC	140.0	18.55	1,693.61	1,693.61	0.00	0.01
P-104	280.00	8.0	PVC	140.0	-10.22	1,693.61	1,693.61	0.00	0.00

Scenario: Max Day Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-105	267.00	8.0	PVC	140.0	-35.10	1,693.61	1,693.62	0.01	0.03
P-106	125.00	8.0	PVC	140.0	-25.77	1,693.62	1,693.62	0.00	0.02
P-107	243.00	8.0	PVC	140.0	-67.90	1,693.64	1,693.66	0.03	0.11
P-108	715.00	8.0	PVC	140.0	43.77	1,693.66	1,693.63	0.03	0.05
P-109	290.00	8.0	PVC	140.0	-55.24	1,693.58	1,693.60	0.02	0.07
P-110	457.00	8.0	PVC	140.0	-34.55	1,693.60	1,693.61	0.01	0.03
P-111	266.00	8.0	PVC	140.0	-62.30	1,693.61	1,693.64	0.02	0.09
P-112	457.00	8.0	PVC	140.0	-19.57	1,693.61	1,693.61	0.01	0.01
P-113	457.00	8.0	PVC	140.0	-15.68	1,693.61	1,693.61	0.00	0.01
P-114	125.00	8.0	PVC	140.0	-63.16	1,693.61	1,693.62	0.01	0.10
P-115	332.00	8.0	PVC	140.0	9.33	1,693.62	1,693.62	0.00	0.00
P-116	484.00	8.0	PVC	140.0	-72.49	1,693.62	1,693.68	0.06	0.12
P-117	295.00	8.0	PVC	140.0	68.96	1,693.56	1,693.52	0.03	0.11
P-118	294.00	8.0	PVC	140.0	-3.60	1,693.51	1,693.51	0.00	0.00
P-119	1,110.00	8.0	PVC	140.0	-25.03	1,693.51	1,693.52	0.02	0.02
P-120	674.00	8.0	PVC	140.0	27.93	1,693.52	1,693.51	0.01	0.02
P-121	668.00	8.0	PVC	140.0	15.53	1,693.51	1,693.51	0.00	0.01
P-122	230.00	8.0	PVC	140.0	9.37	1,693.51	1,693.51	0.00	0.00
P-123	480.00	8.0	PVC	140.0	-5.43	1,693.51	1,693.51	0.00	0.00
P-124	513.00	8.0	PVC	140.0	-5.60	1,693.50	1,693.51	0.00	0.00
P-125	217.00	8.0	PVC	140.0	-0.24	1,693.51	1,693.51	0.00	0.00
P-126	865.00	12.0	PVC	140.0	0.00	1,693.47	1,693.47	0.00	0.00
P-127	847.00	12.0	PVC	140.0	-109.11	1,693.47	1,693.51	0.03	0.04
P-128	1,645.00	12.0	PVC	140.0	-194.30	1,693.51	1,693.68	0.17	0.11
P-129	1,501.00	12.0	PVC	140.0	-327.54	1,693.68	1,694.10	0.42	0.28
P-130	650.00	12.0	PVC	140.0	-168.32	1,694.10	1,694.15	0.05	0.08
P-131	387.00	12.0	PVC	140.0	-286.89	1,694.15	1,694.24	0.08	0.22
P-132	71.00	12.0	PVC	140.0	-521.32	1,694.66	1,694.71	0.05	0.66
P-133	227.00	12.0	PVC	140.0	482.28	1,694.71	1,694.58	0.13	0.57
P-134	47.00	8.0	PVC	140.0	-1,003.60	1,694.71	1,695.46	0.75	16.03
P-135	302.00	12.0	PVC	140.0	-279.55	1,694.39	1,694.46	0.06	0.21
P-136	378.00	12.0	PVC	140.0	-353.04	1,694.46	1,694.58	0.12	0.32
P-137	388.00	8.0	PVC	140.0	64.29	1,694.46	1,694.42	0.04	0.10
P-138	185.00	8.0	PVC	140.0	-46.56	1,694.35	1,694.36	0.01	0.05
P-139	190.00	8.0	PVC	140.0	-44.89	1,694.35	1,694.36	0.01	0.05
P-140	267.00	8.0	PVC	140.0	-95.05	1,694.36	1,694.42	0.05	0.20
P-141	281.00	8.0	PVC	140.0	-37.17	1,694.42	1,694.43	0.01	0.04
P-142	145.00	8.0	PVC	140.0	36.09	1,694.34	1,694.34	0.01	0.03
P-143	491.00	8.0	PVC	140.0	-67.68	1,694.34	1,694.39	0.05	0.11
P-144	282.00	8.0	PVC	140.0	-74.88	1,694.39	1,694.43	0.04	0.13
P-145	268.00	8.0	PVC	140.0	-40.49	1,694.34	1,694.35	0.01	0.04
P-146	280.00	8.0	PVC	140.0	95.77	1,694.34	1,694.28	0.06	0.21
P-147	171.00	6.0	PVC	140.0	-33.72	1,694.26	1,694.28	0.02	0.12
P-148	366.00	8.0	PVC	140.0	54.85	1,694.28	1,694.25	0.03	0.07
P-149	441.00	6.0	PVC	140.0	-0.42	1,694.23	1,694.23	0.00	0.00
P-150	306.00	6.0	PVC	140.0	-18.94	1,694.22	1,694.23	0.01	0.04
P-151	262.00	6.0	PVC	140.0	-28.72	1,694.23	1,694.26	0.02	0.09
P-152	352.00	8.0	PVC	140.0	-37.03	1,694.22	1,694.23	0.01	0.04
P-153	317.00	8.0	PVC	140.0	-46.85	1,694.23	1,694.25	0.02	0.06
P-163	1,664.00	12.0	PVC	140.0	40.03	1,694.24	1,694.23	0.01	0.01
P-164	280.00	8.0	PVC	140.0	32.17	1,693.63	1,693.62	0.01	0.03
P-165	290.00	8.0	PVC	140.0	44.91	1,693.59	1,693.58	0.01	0.05

Scenario: Max Day Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-166	280.00	8.0	PVC	140.0	-69.94	1,693.85	1,693.88	0.03	0.12
P-167	137.00	8.0	PVC	140.0	-82.14	1,693.88	1,693.91	0.02	0.16
P-154	376.00	6.0	PVC	140.0	-2.11	1,694.22	1,694.22	0.00	0.00
P-155	187.00	8.0	PVC	140.0	-18.12	1,694.21	1,694.22	0.00	0.01
P-156	321.00	8.0	PVC	140.0	-24.72	1,694.22	1,694.22	0.01	0.02
P-157	255.00	6.0	PVC	140.0	-13.05	1,694.22	1,694.22	0.01	0.02
P-158	184.00	6.0	PVC	140.0	8.05	1,694.22	1,694.21	0.00	0.01
P-159	410.00	8.0	PVC	140.0	40.03	1,694.23	1,694.21	0.02	0.04
P-160	222.00	8.0	PVC	140.0	-22.57	1,694.21	1,694.21	0.00	0.01
P-161	771.00	12.0	PVC	140.0	0.00	1,694.23	1,694.23	0.00	0.00
P-162	62.00	8.0	PVC	140.0	-62.60	1,694.21	1,694.21	0.01	0.09

Scenario: Peak Hour Demand
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	1,536.00	Demand	10.80	10.80	1,694.25	68.47
J-2	1,531.97	Demand	10.20	10.20	1,694.24	70.21
J-3	1,539.64	Demand	8.10	8.10	1,694.25	66.89
J-4	1,530.85	Demand	10.20	10.20	1,694.24	70.69
J-5	1,535.50	Demand	6.90	6.90	1,694.25	68.68
J-6	1,529.73	Demand	5.40	5.40	1,694.25	71.18
J-7	1,540.40	Demand	0.00	0.00	1,694.29	66.58
J-8	1,538.98	Demand	3.90	3.90	1,694.26	67.18
J-9	1,531.35	Demand	1.20	1.20	1,694.24	70.48
J-10	1,530.21	Demand	1.20	1.20	1,694.24	70.97
J-11	1,530.37	Demand	3.90	3.90	1,694.25	70.90
J-12	1,530.83	Demand	10.20	10.20	1,694.24	70.70
J-13	1,525.46	Demand	9.90	9.90	1,694.24	73.02
J-14	1,525.00	Demand	0.00	0.00	1,694.24	73.22
J-15	1,528.99	Demand	10.20	10.20	1,694.24	71.50
J-16	1,526.12	Demand	10.20	10.20	1,694.24	72.74
J-17	1,529.09	Demand	1.20	1.20	1,694.25	71.46
J-18	1,528.59	Demand	10.20	10.20	1,694.24	71.67
J-19	1,525.00	Demand	9.30	9.30	1,694.24	73.22
J-20	1,532.90	Demand	0.00	0.00	1,694.31	69.84
J-21	1,532.94	Demand	0.00	0.00	1,694.26	69.80
J-22	1,528.90	Demand	12.00	12.00	1,694.26	71.54
J-23	1,530.00	Demand	5.40	5.40	1,694.26	71.07
J-24	1,525.00	Demand	10.80	10.80	1,694.26	73.23
J-25	1,532.00	Demand	12.90	12.90	1,694.26	70.20
J-26	1,526.13	Demand	12.00	12.00	1,694.26	72.74
J-27	1,534.00	Demand	8.70	8.70	1,694.26	69.34
J-28	1,530.94	Demand	6.60	6.60	1,694.26	70.66
J-29	1,527.26	Demand	4.20	4.20	1,694.26	72.25
J-30	1,528.53	Demand	6.60	6.60	1,694.28	71.71
J-31	1,534.00	Demand	8.10	8.10	1,694.29	69.35
J-32	1,526.00	Demand	1.50	1.50	1,694.29	72.81
J-33	1,535.12	Demand	9.90	9.90	1,694.30	68.87
J-34	1,527.12	Demand	8.70	8.70	1,694.30	72.33
J-35	1,536.24	Demand	3.90	3.90	1,694.32	68.39
J-36	1,534.24	Demand	4.80	4.80	1,694.33	69.26
J-37	1,528.24	Demand	8.10	8.10	1,694.31	71.85
J-38	1,533.83	Demand	0.00	0.00	1,694.39	69.47
J-39	1,532.83	Demand	7.50	7.50	1,694.41	69.91
J-40	1,536.75	Demand	0.00	0.00	1,694.42	68.21
J-41	1,533.89	Demand	4.80	4.80	1,694.41	69.45
J-42	1,528.63	Demand	5.40	5.40	1,694.42	71.73
J-43	1,535.01	Demand	4.80	4.80	1,694.42	68.97
J-44	1,532.28	Demand	8.10	8.10	1,694.44	70.16
J-45	1,529.75	Demand	6.00	6.00	1,694.43	71.25
J-46	1,532.28	Demand	7.50	7.50	1,694.49	70.18
J-47	1,537.00	Demand	6.90	6.90	1,694.52	68.15
J-48	1,529.29	Demand	4.80	4.80	1,694.51	71.48
J-49	1,540.06	Demand	3.90	3.90	1,694.55	66.84
J-50	1,530.41	Demand	10.80	10.80	1,694.54	71.01
J-51	1,541.54	Demand	2.10	2.10	1,694.59	66.22
J-52	1,540.03	Demand	8.70	8.70	1,694.62	66.88
J-53	1,531.53	Demand	10.20	10.20	1,694.55	70.53

Scenario: Peak Hour Demand
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-54	1,542.37	Demand	0.00	0.00	1,694.71	65.91
J-55	1,542.30	Demand	8.10	8.10	1,694.77	65.97
J-56	1,546.95	Demand	0.00	0.00	1,694.66	63.91
J-57	1,547.00	Demand	4.20	4.20	1,694.80	63.95
J-58	1,530.09	Demand	7.50	7.50	1,694.92	71.32
J-59	1,552.60	Demand	10.20	10.20	1,694.83	61.54
J-60	1,533.24	Demand	9.90	9.90	1,694.99	69.98
J-61	1,553.85	Demand	3.30	3.30	1,694.83	61.00
J-62	1,550.92	Demand	2.70	2.70	1,694.83	62.26
J-63	1,534.37	Demand	6.00	6.00	1,694.94	69.47
J-64	1,553.49	Demand	0.00	0.00	1,694.81	61.14
J-65	1,560.21	Demand	0.00	0.00	1,694.74	58.21
J-66	1,536.24	Demand	6.90	6.90	1,694.85	68.62
J-67	1,566.04	Demand	4.20	4.20	1,694.62	55.63
J-68	1,555.37	Demand	4.80	4.80	1,694.62	60.25
J-69	1,549.96	Demand	2.10	2.10	1,694.62	62.59
J-70	1,575.94	Demand	6.60	6.60	1,694.63	51.35
J-71	1,559.91	Demand	6.90	6.90	1,694.63	58.29
J-72	1,586.00	Demand	6.60	6.60	1,694.63	47.00
J-73	1,570.00	Demand	6.00	6.00	1,694.65	53.93
J-74	1,551.03	Demand	0.00	0.00	1,694.60	62.12
J-75	1,549.49	Demand	6.00	6.00	1,694.53	62.75
J-76	1,552.01	Demand	3.30	3.30	1,694.48	61.64
J-77	1,548.53	Demand	5.40	5.40	1,694.46	63.14
J-78	1,539.94	Demand	4.80	4.80	1,694.49	66.87
J-79	1,553.51	Demand	5.40	5.40	1,694.50	61.00
J-80	1,545.90	Demand	3.30	3.30	1,694.51	64.30
J-81	1,565.87	Demand	0.00	0.00	1,694.65	55.72
J-82	1,559.48	Demand	0.00	0.00	1,694.69	58.50
J-83	1,549.45	Demand	8.10	8.10	1,694.41	62.72
J-84	1,541.24	Demand	4.80	4.80	1,694.35	66.25
J-85	1,542.55	Demand	9.30	9.30	1,694.34	65.67
J-86	1,545.58	Demand	9.30	9.30	1,694.36	64.37
J-87	1,543.13	Demand	6.60	6.60	1,694.37	65.43
J-88	1,544.25	Demand	6.00	6.00	1,694.37	64.95
J-89	1,545.37	Demand	6.00	6.00	1,694.37	64.47
J-90	1,540.98	Demand	3.30	3.30	1,694.37	66.37
J-91	1,542.01	Demand	2.70	2.70	1,694.36	65.92
J-92	1,546.10	Demand	6.90	6.90	1,694.38	64.15
J-93	1,547.22	Demand	6.90	6.90	1,694.37	63.67
J-94	1,543.00	Demand	6.90	6.90	1,694.38	65.49
J-95	1,538.70	Demand	0.00	0.00	1,694.38	67.36
J-96	1,538.07	Demand	4.80	4.80	1,694.38	67.63
J-97	1,548.50	Demand	4.20	4.20	1,694.39	63.12
J-98	1,539.19	Demand	8.70	8.70	1,694.39	67.15
J-99	1,540.36	Demand	0.00	0.00	1,694.38	66.64
J-100	1,544.05	Demand	12.00	12.00	1,694.32	65.02
J-101	1,549.13	Demand	2.70	2.70	1,694.31	62.81
J-102	1,548.00	Demand	12.00	12.00	1,694.31	63.30
J-103	1,546.73	Demand	9.30	9.30	1,694.32	63.85
J-104	1,535.33	Demand	4.80	4.80	1,694.31	68.78
J-105	1,537.75	Demand	6.90	6.90	1,694.31	67.74
J-106	1,542.00	Demand	4.20	4.20	1,694.31	65.90

Scenario: Peak Hour Demand
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-107	1,537.55	Demand	0.00	0.00	1,694.29	67.82
J-108	1,533.80	Demand	0.00	0.00	1,695.02	69.75
J-110	1,543.37	Demand	6.90	6.90	1,694.87	65.55
J-111	1,542.26	Demand	4.80	4.80	1,694.85	66.02
J-112	1,549.81	Demand	2.70	2.70	1,694.82	62.74
J-113	1,553.62	Demand	3.30	3.30	1,694.81	61.09
J-114	1,557.00	Demand	3.30	3.30	1,694.80	59.62
J-115	1,554.22	Demand	6.00	6.00	1,694.80	60.82
J-116	1,538.78	Demand	5.40	5.40	1,694.83	67.52
J-117	1,555.55	Demand	5.40	5.40	1,694.77	60.23
J-118	1,558.97	Demand	3.80	3.80	1,694.75	58.75
J-119	1,540.30	Demand	6.00	6.00	1,694.75	66.82
J-120	1,560.03	Demand	7.60	7.60	1,694.74	58.28
J-121	1,544.42	Demand	7.00	7.00	1,694.74	65.04
J-122	1,558.62	Demand	6.00	6.00	1,694.73	58.89
J-124	1,544.87	Demand	7.60	7.60	1,694.73	64.84
J-127	1,565.00	Demand	0.00	0.00	1,694.74	56.13
J-132	1,565.00	Demand	0.00	0.00	1,694.74	56.13
J-133	1,538.48	Demand	9.20	9.20	1,694.54	67.52
J-126	1,558.61	Demand	3.80	3.80	1,694.73	58.89
J-128	1,552.52	Demand	2.70	2.70	1,694.73	61.53
J-129	1,546.07	Demand	4.90	4.90	1,694.73	64.32
J-130	1,555.29	Demand	0.00	0.00	1,694.73	60.33
J-131	1,555.84	Demand	46.90	46.90	1,694.72	60.09

Scenario: Peak Hour Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	932.00	8.0	PVC	140.0	10.99	1,694.25	1,694.24	0.00	0.00
P-2	816.00	8.0	PVC	140.0	17.05	1,694.25	1,694.24	0.01	0.01
P-3	518.00	8.0	PVC	140.0	20.19	1,694.25	1,694.25	0.01	0.01
P-4	224.00	8.0	PVC	140.0	81.83	1,694.29	1,694.26	0.03	0.15
P-5	285.00	8.0	PVC	140.0	21.46	1,694.24	1,694.24	0.00	0.01
P-6	381.00	8.0	PVC	140.0	-21.79	1,694.25	1,694.25	0.01	0.01
P-7	167.00	8.0	PVC	140.0	-46.94	1,694.25	1,694.26	0.01	0.06
P-8	323.00	8.0	PVC	140.0	30.99	1,694.26	1,694.25	0.01	0.03
P-9	350.00	8.0	PVC	140.0	3.90	1,694.25	1,694.25	0.00	0.00
P-10	155.00	8.0	PVC	140.0	0.79	1,694.24	1,694.24	0.00	0.00
P-11	125.00	8.0	PVC	140.0	-21.87	1,694.24	1,694.24	0.00	0.01
P-12	280.00	8.0	PVC	140.0	-15.02	1,694.24	1,694.25	0.00	0.01
P-13	897.00	8.0	PVC	140.0	6.84	1,694.24	1,694.24	0.00	0.00
P-14	176.00	8.0	PVC	140.0	0.00	1,694.24	1,694.24	0.00	0.00
P-15	897.00	8.0	PVC	140.0	9.49	1,694.24	1,694.24	0.00	0.00
P-16	160.00	8.0	PVC	140.0	-0.23	1,694.25	1,694.25	0.00	0.00
P-17	125.00	8.0	PVC	140.0	39.74	1,694.25	1,694.24	0.01	0.04
P-18	897.00	8.0	PVC	140.0	13.07	1,694.24	1,694.24	0.00	0.01
P-19	155.00	8.0	PVC	140.0	-17.04	1,694.24	1,694.24	0.00	0.01
P-20	125.00	8.0	PVC	140.0	3.22	1,694.24	1,694.24	0.00	0.00
P-21	280.00	8.0	PVC	140.0	-16.47	1,694.24	1,694.24	0.00	0.01
P-22	280.00	8.0	PVC	140.0	-3.06	1,694.24	1,694.24	0.00	0.00
P-23	280.00	8.0	PVC	140.0	-3.77	1,694.24	1,694.24	0.00	0.00
P-24	550.00	8.0	PVC	140.0	63.72	1,694.31	1,694.26	0.05	0.10
P-25	313.00	8.0	PVC	140.0	41.17	1,694.26	1,694.25	0.01	0.04
P-26	205.00	8.0	PVC	140.0	22.55	1,694.26	1,694.26	0.00	0.01
P-27	265.00	8.0	PVC	140.0	-5.97	1,694.26	1,694.26	0.00	0.00
P-28	831.00	8.0	PVC	140.0	4.58	1,694.26	1,694.26	0.00	0.00
P-29	897.00	8.0	PVC	140.0	-1.44	1,694.26	1,694.26	0.00	0.00
P-30	498.00	8.0	PVC	140.0	-19.60	1,694.26	1,694.26	0.01	0.01
P-31	208.00	8.0	PVC	140.0	23.86	1,694.26	1,694.26	0.00	0.02
P-32	284.00	8.0	PVC	140.0	0.57	1,694.26	1,694.26	0.00	0.00
P-33	273.00	8.0	PVC	140.0	-10.90	1,694.26	1,694.26	0.00	0.00
P-34	282.00	8.0	PVC	140.0	-6.22	1,694.26	1,694.26	0.00	0.00
P-35	282.00	8.0	PVC	140.0	-19.66	1,694.26	1,694.26	0.00	0.01
P-36	353.00	8.0	PVC	140.0	-50.05	1,694.26	1,694.28	0.02	0.06
P-37	454.00	8.0	PVC	140.0	23.25	1,694.29	1,694.28	0.01	0.02
P-38	126.00	8.0	PVC	140.0	-33.41	1,694.28	1,694.29	0.00	0.03
P-39	581.00	8.0	PVC	140.0	8.99	1,694.30	1,694.30	0.00	0.00
P-40	151.00	8.0	PVC	140.0	-54.13	1,694.32	1,694.33	0.01	0.07
P-41	436.00	8.0	PVC	140.0	42.72	1,694.33	1,694.31	0.02	0.05
P-42	280.00	8.0	PVC	140.0	-31.35	1,694.29	1,694.30	0.01	0.03
P-43	266.00	8.0	PVC	140.0	-50.23	1,694.30	1,694.32	0.02	0.06
P-44	280.00	8.0	PVC	140.0	-34.91	1,694.29	1,694.30	0.01	0.03
P-45	280.00	8.0	PVC	140.0	-34.62	1,694.30	1,694.31	0.01	0.03
P-46	284.00	8.0	PVC	140.0	-101.65	1,694.33	1,694.39	0.07	0.23
P-47	184.00	8.0	PVC	140.0	-56.08	1,694.39	1,694.41	0.01	0.08
P-48	455.00	8.0	PVC	140.0	45.58	1,694.42	1,694.39	0.02	0.05
P-49	265.00	8.0	PVC	140.0	32.99	1,694.41	1,694.41	0.01	0.03
P-50	395.00	8.0	PVC	140.0	-30.58	1,694.41	1,694.42	0.01	0.02
P-51	349.00	8.0	PVC	140.0	-42.59	1,694.42	1,694.44	0.02	0.05
P-52	317.00	8.0	PVC	140.0	41.98	1,694.44	1,694.43	0.01	0.04

Scenario: Peak Hour Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-53	266.00	8.0	PVC	140.0	-37.79	1,694.41	1,694.42	0.01	0.04
P-54	280.00	8.0	PVC	140.0	-35.98	1,694.42	1,694.43	0.01	0.03
P-55	280.00	8.0	PVC	140.0	-92.68	1,694.44	1,694.49	0.05	0.19
P-56	429.00	8.0	PVC	140.0	45.54	1,694.52	1,694.49	0.02	0.05
P-57	272.00	8.0	PVC	140.0	-54.64	1,694.49	1,694.51	0.02	0.07
P-58	838.00	8.0	PVC	140.0	20.61	1,694.55	1,694.54	0.01	0.01
P-59	132.00	8.0	PVC	140.0	-88.25	1,694.59	1,694.62	0.02	0.18
P-60	712.00	8.0	PVC	140.0	59.83	1,694.62	1,694.55	0.06	0.09
P-61	266.00	8.0	PVC	140.0	-86.15	1,694.55	1,694.59	0.05	0.17
P-62	280.00	8.0	PVC	140.0	-59.44	1,694.51	1,694.54	0.02	0.09
P-63	280.00	8.0	PVC	140.0	-49.63	1,694.54	1,694.55	0.02	0.06
P-64	177.00	8.0	PVC	140.0	-156.78	1,694.62	1,694.71	0.09	0.51
P-65	215.00	12.0	PVC	140.0	-344.48	1,694.71	1,694.77	0.07	0.31
P-66	457.00	12.0	PVC	140.0	-187.70	1,694.66	1,694.71	0.05	0.10
P-67	261.00	8.0	PVC	140.0	66.41	1,694.80	1,694.77	0.03	0.10
P-68	689.00	12.0	PVC	140.0	-286.17	1,694.77	1,694.92	0.15	0.22
P-69	897.00	8.0	PVC	140.0	-87.39	1,694.83	1,694.99	0.16	0.17
P-70	146.00	8.0	PVC	140.0	3.28	1,694.83	1,694.83	0.00	0.00
P-71	280.00	8.0	PVC	140.0	-70.61	1,694.80	1,694.83	0.03	0.12
P-72	280.00	8.0	PVC	140.0	6.58	1,694.83	1,694.83	0.00	0.00
P-73	292.00	12.0	PVC	140.0	-293.67	1,694.92	1,694.99	0.07	0.23
P-74	190.00	12.0	PVC	140.0	210.21	1,694.83	1,694.81	0.02	0.12
P-75	411.00	12.0	PVC	140.0	245.15	1,694.81	1,694.74	0.07	0.16
P-76	468.00	8.0	PVC	140.0	90.91	1,694.94	1,694.85	0.09	0.19
P-77	392.00	8.0	PVC	140.0	23.21	1,694.62	1,694.62	0.01	0.01
P-78	199.00	8.0	PVC	140.0	-33.33	1,694.62	1,694.62	0.01	0.03
P-79	591.00	8.0	PVC	140.0	-14.43	1,694.63	1,694.63	0.00	0.01
P-80	597.00	8.0	PVC	140.0	-26.18	1,694.63	1,694.65	0.01	0.02
P-81	300.00	8.0	PVC	140.0	-27.41	1,694.62	1,694.63	0.01	0.02
P-82	291.00	8.0	PVC	140.0	-19.58	1,694.63	1,694.63	0.00	0.01
P-83	300.00	8.0	PVC	140.0	-35.43	1,694.62	1,694.63	0.01	0.03
P-84	217.00	8.0	PVC	140.0	51.74	1,694.62	1,694.60	0.01	0.07
P-85	230.00	8.0	PVC	140.0	120.06	1,694.60	1,694.53	0.07	0.31
P-86	520.00	8.0	PVC	140.0	-68.32	1,694.60	1,694.66	0.06	0.11
P-87	232.00	8.0	PVC	140.0	51.64	1,694.48	1,694.46	0.02	0.07
P-88	530.00	8.0	PVC	140.0	-45.62	1,694.46	1,694.49	0.03	0.05
P-89	408.00	8.0	PVC	140.0	-60.34	1,694.50	1,694.53	0.04	0.09
P-90	360.00	8.0	PVC	140.0	53.72	1,694.53	1,694.51	0.03	0.07
P-91	276.00	8.0	PVC	140.0	-54.94	1,694.48	1,694.50	0.02	0.07
P-92	290.00	8.0	PVC	140.0	-50.42	1,694.49	1,694.51	0.02	0.06
P-93	180.00	8.0	PVC	140.0	-56.75	1,694.63	1,694.65	0.01	0.08
P-94	125.00	8.0	PVC	140.0	32.18	1,694.65	1,694.65	0.00	0.03
P-95	247.00	8.0	PVC	140.0	-88.94	1,694.65	1,694.69	0.04	0.18
P-96	285.00	8.0	PVC	140.0	91.86	1,694.46	1,694.41	0.05	0.19
P-97	327.00	8.0	PVC	140.0	36.63	1,694.35	1,694.34	0.01	0.03
P-98	758.00	8.0	PVC	140.0	-24.39	1,694.34	1,694.36	0.01	0.02
P-99	280.00	8.0	PVC	140.0	-22.12	1,694.37	1,694.37	0.00	0.01
P-100	280.00	8.0	PVC	140.0	-13.44	1,694.37	1,694.37	0.00	0.01
P-101	267.00	8.0	PVC	140.0	-7.68	1,694.37	1,694.37	0.00	0.00
P-102	258.00	8.0	PVC	140.0	36.39	1,694.37	1,694.36	0.01	0.03
P-103	280.00	8.0	PVC	140.0	13.92	1,694.38	1,694.37	0.00	0.01
P-104	280.00	8.0	PVC	140.0	-7.66	1,694.37	1,694.38	0.00	0.00

Scenario: Peak Hour Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-105	267.00	8.0	PVC	140.0	-26.32	1,694.38	1,694.38	0.01	0.02
P-106	125.00	8.0	PVC	140.0	-19.33	1,694.38	1,694.38	0.00	0.01
P-107	243.00	8.0	PVC	140.0	-50.93	1,694.39	1,694.41	0.02	0.06
P-108	715.00	8.0	PVC	140.0	32.83	1,694.41	1,694.39	0.02	0.03
P-109	290.00	8.0	PVC	140.0	-41.43	1,694.35	1,694.37	0.01	0.04
P-110	457.00	8.0	PVC	140.0	-25.91	1,694.37	1,694.38	0.01	0.02
P-111	266.00	8.0	PVC	140.0	-46.73	1,694.38	1,694.39	0.01	0.05
P-112	457.00	8.0	PVC	140.0	-14.68	1,694.37	1,694.37	0.00	0.01
P-113	457.00	8.0	PVC	140.0	-11.76	1,694.37	1,694.38	0.00	0.00
P-114	125.00	8.0	PVC	140.0	-47.37	1,694.37	1,694.38	0.01	0.06
P-115	332.00	8.0	PVC	140.0	6.99	1,694.38	1,694.38	0.00	0.00
P-116	484.00	8.0	PVC	140.0	-54.36	1,694.38	1,694.42	0.04	0.07
P-117	295.00	8.0	PVC	140.0	51.72	1,694.34	1,694.32	0.02	0.07
P-118	294.00	8.0	PVC	140.0	-2.70	1,694.31	1,694.31	0.00	0.00
P-119	1,110.00	8.0	PVC	140.0	-18.78	1,694.31	1,694.32	0.01	0.01
P-120	674.00	8.0	PVC	140.0	20.95	1,694.32	1,694.32	0.01	0.01
P-121	668.00	8.0	PVC	140.0	11.65	1,694.32	1,694.31	0.00	0.00
P-122	230.00	8.0	PVC	140.0	7.02	1,694.31	1,694.31	0.00	0.00
P-123	480.00	8.0	PVC	140.0	-4.08	1,694.31	1,694.31	0.00	0.00
P-124	513.00	8.0	PVC	140.0	-4.20	1,694.31	1,694.31	0.00	0.00
P-125	217.00	8.0	PVC	140.0	-0.18	1,694.31	1,694.31	0.00	0.00
P-126	865.00	12.0	PVC	140.0	0.00	1,694.29	1,694.29	0.00	0.00
P-127	847.00	12.0	PVC	140.0	-81.83	1,694.29	1,694.31	0.02	0.02
P-128	1,645.00	12.0	PVC	140.0	-145.73	1,694.31	1,694.42	0.10	0.06
P-129	1,501.00	12.0	PVC	140.0	-245.66	1,694.42	1,694.66	0.25	0.16
P-130	650.00	12.0	PVC	140.0	-126.29	1,694.66	1,694.69	0.03	0.05
P-131	387.00	12.0	PVC	140.0	-215.22	1,694.69	1,694.74	0.05	0.13
P-132	71.00	12.0	PVC	140.0	-390.95	1,694.99	1,695.02	0.03	0.39
P-133	227.00	12.0	PVC	140.0	361.65	1,695.02	1,694.94	0.08	0.34
P-134	47.00	8.0	PVC	140.0	-752.60	1,695.02	1,695.46	0.44	9.41
P-135	302.00	12.0	PVC	140.0	-209.63	1,694.83	1,694.87	0.04	0.12
P-136	378.00	12.0	PVC	140.0	-264.73	1,694.87	1,694.94	0.07	0.19
P-137	388.00	8.0	PVC	140.0	48.20	1,694.87	1,694.85	0.02	0.06
P-138	185.00	8.0	PVC	140.0	-34.94	1,694.81	1,694.82	0.01	0.03
P-139	190.00	8.0	PVC	140.0	-33.64	1,694.81	1,694.82	0.01	0.03
P-140	267.00	8.0	PVC	140.0	-71.28	1,694.82	1,694.85	0.03	0.12
P-141	281.00	8.0	PVC	140.0	-27.88	1,694.85	1,694.85	0.01	0.02
P-142	145.00	8.0	PVC	140.0	27.04	1,694.80	1,694.80	0.00	0.02
P-143	491.00	8.0	PVC	140.0	-50.74	1,694.80	1,694.83	0.03	0.06
P-144	282.00	8.0	PVC	140.0	-56.14	1,694.83	1,694.85	0.02	0.08
P-145	268.00	8.0	PVC	140.0	-30.34	1,694.80	1,694.81	0.01	0.02
P-146	280.00	8.0	PVC	140.0	71.78	1,694.80	1,694.77	0.03	0.12
P-147	171.00	6.0	PVC	140.0	-25.29	1,694.75	1,694.77	0.01	0.07
P-148	366.00	8.0	PVC	140.0	41.09	1,694.77	1,694.75	0.02	0.04
P-149	441.00	6.0	PVC	140.0	-0.32	1,694.74	1,694.74	0.00	0.00
P-150	306.00	6.0	PVC	140.0	-14.21	1,694.73	1,694.74	0.01	0.02
P-151	262.00	6.0	PVC	140.0	-21.49	1,694.74	1,694.75	0.01	0.05
P-152	352.00	8.0	PVC	140.0	-27.77	1,694.73	1,694.74	0.01	0.02
P-153	317.00	8.0	PVC	140.0	-35.09	1,694.74	1,694.75	0.01	0.03
P-154	376.00	6.0	PVC	140.0	-1.60	1,694.73	1,694.73	0.00	0.00
P-155	187.00	8.0	PVC	140.0	-13.66	1,694.73	1,694.73	0.00	0.01
P-156	321.00	8.0	PVC	140.0	-18.56	1,694.73	1,694.73	0.00	0.01

Scenario: Peak Hour Demand
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-157	255.00	6.0	PVC	140.0	-9.81	1,694.73	1,694.73	0.00	0.01
P-158	184.00	6.0	PVC	140.0	6.01	1,694.73	1,694.73	0.00	0.00
P-159	410.00	8.0	PVC	140.0	29.92	1,694.74	1,694.73	0.01	0.02
P-160	222.00	8.0	PVC	140.0	-16.98	1,694.73	1,694.73	0.00	0.01
P-161	771.00	12.0	PVC	140.0	-0.00	1,694.74	1,694.74	0.00	0.00
P-162	62.00	8.0	PVC	140.0	-46.90	1,694.72	1,694.73	0.00	0.06
P-163	1,664.00	12.0	PVC	140.0	29.92	1,694.74	1,694.74	0.01	0.00
P-164	280.00	8.0	PVC	140.0	24.13	1,694.39	1,694.38	0.00	0.02
P-165	290.00	8.0	PVC	140.0	33.69	1,694.36	1,694.36	0.01	0.03
P-166	280.00	8.0	PVC	140.0	-52.44	1,694.52	1,694.54	0.02	0.07
P-167	137.00	8.0	PVC	140.0	-61.64	1,694.54	1,694.55	0.01	0.09

Scenario: Fire Flow
Fire Flow Analysis
Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Residual Pressure (psi)	Calculated Residual Pressure (psi)	Calculated Minimum Zone Pressure (psi)	Minimum System Pressure (psi)	Calculated Minimum System Pressure (psi)
J-1	true	true	1,000.00	1,500.00	1,007.20	1,507.20	20.00	59.02	45.03	20.00	45.03
J-2	true	true	1,000.00	1,500.00	1,006.80	1,506.80	20.00	61.59	45.03	20.00	45.03
J-3	true	true	1,000.00	1,500.00	1,005.40	1,505.40	20.00	59.48	45.03	20.00	45.03
J-4	true	true	1,000.00	1,500.00	1,006.80	1,506.80	20.00	63.27	45.03	20.00	45.03
J-5	true	true	1,000.00	1,500.00	1,004.60	1,504.60	20.00	60.58	45.03	20.00	45.03
J-6	true	true	1,000.00	1,500.00	1,003.60	1,503.60	20.00	64.05	45.03	20.00	45.03
J-7	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	60.87	45.02	20.00	45.02
J-8	true	true	1,000.00	1,500.00	1,002.60	1,502.60	20.00	60.53	45.03	20.00	45.03
J-9	true	true	1,000.00	1,500.00	1,000.80	1,500.80	20.00	62.86	45.03	20.00	45.03
J-10	true	true	1,000.00	1,500.00	1,000.80	1,500.80	20.00	62.78	45.03	20.00	45.03
J-11	true	true	1,000.00	1,500.00	1,002.60	1,502.60	20.00	57.68	45.03	20.00	45.03
J-12	true	true	1,000.00	1,500.00	1,006.80	1,506.80	20.00	61.30	45.03	20.00	45.03
J-13	true	true	1,000.00	1,500.00	1,006.60	1,506.60	20.00	62.24	45.03	20.00	45.03
J-14	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	59.87	45.03	20.00	45.03
J-15	true	true	1,000.00	1,500.00	1,006.80	1,506.80	20.00	63.26	45.03	20.00	45.03
J-16	true	true	1,000.00	1,500.00	1,006.80	1,506.80	20.00	62.92	45.03	20.00	45.03
J-17	true	true	1,000.00	1,500.00	1,000.80	1,500.80	20.00	64.59	45.03	20.00	45.03
J-18	true	true	1,000.00	1,500.00	1,006.80	1,506.80	20.00	63.99	45.03	20.00	45.03
J-19	true	true	1,000.00	1,500.00	1,006.20	1,506.20	20.00	62.72	45.03	20.00	45.03
J-20	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	65.13	45.02	20.00	45.02
J-21	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	63.80	45.03	20.00	45.03
J-22	true	true	1,000.00	1,500.00	1,008.00	1,508.00	20.00	64.70	45.03	20.00	45.03
J-23	true	true	1,000.00	1,500.00	1,003.60	1,503.60	20.00	63.09	45.04	20.00	45.04
J-24	true	true	1,000.00	1,500.00	1,007.20	1,507.20	20.00	64.24	45.04	20.00	45.04
J-25	true	true	1,000.00	1,500.00	1,008.60	1,508.60	20.00	62.23	45.04	20.00	45.04
J-26	true	true	1,000.00	1,500.00	1,008.00	1,508.00	20.00	64.59	45.04	20.00	45.04
J-27	true	true	1,000.00	1,500.00	1,005.80	1,505.80	20.00	60.64	45.04	20.00	45.04
J-28	true	true	1,000.00	1,500.00	1,004.40	1,504.40	20.00	63.18	45.04	20.00	45.04
J-29	true	true	1,000.00	1,500.00	1,002.80	1,502.80	20.00	64.05	45.04	20.00	45.04
J-30	true	true	1,000.00	1,500.00	1,004.40	1,504.40	20.00	64.50	45.06	20.00	45.06
J-31	true	true	1,000.00	1,500.00	1,005.40	1,505.40	20.00	61.14	45.06	20.00	45.06
J-32	true	true	1,000.00	1,500.00	1,001.00	1,501.00	20.00	65.24	45.06	20.00	45.06
J-33	true	true	1,000.00	1,500.00	1,006.60	1,506.60	20.00	61.54	45.06	20.00	45.06
J-34	true	true	1,000.00	1,500.00	1,005.80	1,505.80	20.00	64.93	45.06	20.00	45.06
J-35	true	true	1,000.00	1,500.00	1,002.60	1,502.60	20.00	61.27	45.07	20.00	45.07
J-36	true	true	1,000.00	1,500.00	1,003.20	1,503.20	20.00	62.96	45.07	20.00	45.07

Scenario: Fire Flow
Fire Flow Analysis
Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Residual Pressure (psi)	Calculated Residual Pressure (psi)	Calculated Minimum Zone Pressure (psi)	Minimum System Pressure (psi)	Calculated Minimum System Pressure (psi)
J-37	true	true	1,000.00	1,500.00	1,005.40	1,505.40	20.00	63.97	45.06	20.00	45.06
J-38	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	64.81	45.08	20.00	45.08
J-39	true	true	1,000.00	1,500.00	1,005.00	1,505.00	20.00	64.72	45.11	20.00	45.11
J-40	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	64.79	45.03	20.00	45.03
J-41	true	true	1,000.00	1,500.00	1,003.20	1,503.20	20.00	63.04	45.13	20.00	45.13
J-42	true	true	1,000.00	1,500.00	1,003.60	1,503.60	20.00	64.93	45.13	20.00	45.13
J-43	true	true	1,000.00	1,500.00	1,003.20	1,503.20	20.00	62.38	45.13	20.00	45.13
J-44	true	true	1,000.00	1,500.00	1,005.40	1,505.40	20.00	64.72	45.15	20.00	45.15
J-45	true	true	1,000.00	1,500.00	1,004.00	1,504.00	20.00	64.55	45.13	20.00	45.13
J-46	true	true	1,000.00	1,500.00	1,005.00	1,505.00	20.00	65.07	45.17	20.00	45.17
J-47	true	true	1,000.00	1,500.00	1,004.60	1,504.60	20.00	62.02	45.19	20.00	45.19
J-48	true	true	1,000.00	1,500.00	1,003.20	1,503.20	20.00	65.77	45.18	20.00	45.18
J-49	true	true	1,000.00	1,500.00	1,002.60	1,502.60	20.00	61.88	45.19	20.00	45.19
J-50	true	true	1,000.00	1,500.00	1,007.20	1,507.20	20.00	65.66	45.19	20.00	45.19
J-51	true	true	1,000.00	1,500.00	1,001.40	1,501.40	20.00	61.78	45.20	20.00	45.20
J-52	true	true	1,000.00	1,500.00	1,005.80	1,505.80	20.00	63.29	45.20	20.00	45.20
J-53	true	true	1,000.00	1,500.00	1,006.80	1,506.80	20.00	64.58	45.19	20.00	45.19
J-54	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	63.95	45.25	20.00	45.25
J-55	true	true	1,000.00	1,500.00	1,005.40	1,505.40	20.00	64.17	45.40	20.00	45.40
J-56	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	61.79	45.05	20.00	45.05
J-57	true	true	1,000.00	1,500.00	1,002.80	1,502.80	20.00	61.17	45.55	20.00	45.55
J-58	true	true	1,000.00	1,500.00	1,005.00	1,505.00	20.00	69.84	45.75	20.00	45.75
J-59	true	true	1,000.00	1,500.00	1,006.80	1,506.80	20.00	59.14	45.67	20.00	45.67
J-60	true	true	1,000.00	1,500.00	1,006.60	1,506.60	20.00	68.85	46.01	20.00	46.01
J-61	true	true	1,000.00	1,500.00	1,002.20	1,502.20	20.00	58.61	45.59	20.00	45.59
J-62	true	true	1,000.00	1,500.00	1,001.80	1,501.80	20.00	60.62	45.53	20.00	45.53
J-63	true	true	1,000.00	1,500.00	1,004.00	1,504.00	20.00	68.14	45.82	20.00	45.82
J-64	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	59.43	45.44	20.00	45.44
J-65	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	56.29	45.22	20.00	45.22
J-66	true	true	1,000.00	1,500.00	1,004.60	1,504.60	20.00	66.10	45.66	20.00	45.66
J-67	true	true	1,000.00	1,500.00	1,002.80	1,502.80	20.00	50.34	43.10	20.00	43.10
J-68	true	true	1,000.00	1,500.00	1,003.20	1,503.20	20.00	56.28	43.74	20.00	43.74
J-69	true	true	1,000.00	1,500.00	1,001.40	1,501.40	20.00	57.98	43.56	20.00	43.56
J-70	true	true	1,000.00	1,500.00	1,004.40	1,504.40	20.00	46.50	42.60	20.00	42.60
J-71	true	true	1,000.00	1,500.00	1,004.60	1,504.60	20.00	54.22	43.50	20.00	43.50
J-72	true	true	1,000.00	1,500.00	1,004.40	1,504.40	20.00	41.27	47.07	20.00	47.07

H1 →

Fire Flow Analysis
Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Residual Pressure (psi)	Calculated Residual Pressure (psi)	Calculated Minimum Zone Pressure (psi)	Minimum System Pressure (psi)	Calculated Minimum System Pressure (psi)
J-73	true	true	1,000.00	1,500.00	1,004.00	1,504.00	20.00	49.33	43.10	20.00	43.10
J-74	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	58.57	44.32	20.00	44.32
J-75	true	true	1,000.00	1,500.00	1,004.00	1,504.00	20.00	58.06	44.52	20.00	44.52
J-76	true	true	1,000.00	1,500.00	1,002.20	1,502.20	20.00	55.49	44.63	20.00	44.63
J-77	true	true	1,000.00	1,500.00	1,003.60	1,503.60	20.00	57.80	44.68	20.00	44.68
J-78	true	true	1,000.00	1,500.00	1,003.20	1,503.20	20.00	59.99	44.59	20.00	44.59
J-79	true	true	1,000.00	1,500.00	1,003.60	1,503.60	20.00	54.69	44.58	20.00	44.58
J-80	true	true	1,000.00	1,500.00	1,002.20	1,502.20	20.00	57.73	44.57	20.00	44.57
J-81	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	52.11	43.56	20.00	43.56
J-82	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	56.43	44.98	20.00	44.98
J-83	true	true	1,000.00	1,500.00	1,005.40	1,505.40	20.00	57.42	44.81	20.00	44.81
J-84	true	true	1,000.00	1,500.00	1,003.20	1,503.20	20.00	59.94	44.93	20.00	44.93
J-85	true	true	1,000.00	1,500.00	1,006.20	1,506.20	20.00	59.79	44.96	20.00	44.96
J-86	true	true	1,000.00	1,500.00	1,006.20	1,506.20	20.00	56.99	44.94	20.00	44.94
J-87	true	true	1,000.00	1,500.00	1,004.40	1,504.40	20.00	59.79	44.91	20.00	44.91
J-88	true	true	1,000.00	1,500.00	1,004.00	1,504.00	20.00	59.38	44.91	20.00	44.91
J-89	true	true	1,000.00	1,500.00	1,004.00	1,504.00	20.00	59.06	44.92	20.00	44.92
J-90	true	true	1,000.00	1,500.00	1,002.20	1,502.20	20.00	61.22	44.93	20.00	44.93
J-91	true	true	1,000.00	1,500.00	1,001.80	1,501.80	20.00	59.27	44.93	20.00	44.93
J-92	true	true	1,000.00	1,500.00	1,004.60	1,504.60	20.00	58.60	44.89	20.00	44.89
J-93	true	true	1,000.00	1,500.00	1,004.60	1,504.60	20.00	58.11	44.90	20.00	44.90
J-94	true	true	1,000.00	1,500.00	1,004.60	1,504.60	20.00	60.05	44.91	20.00	44.91
J-95	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	61.97	44.91	20.00	44.91
J-96	true	true	1,000.00	1,500.00	1,003.20	1,503.20	20.00	61.54	44.89	20.00	44.89
J-97	true	true	1,000.00	1,500.00	1,002.80	1,502.80	20.00	57.25	44.86	20.00	44.86
J-98	true	true	1,000.00	1,500.00	1,005.80	1,505.80	20.00	60.26	44.88	20.00	44.88
J-99	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	61.81	44.94	20.00	44.94
J-100	true	true	1,000.00	1,500.00	1,008.00	1,508.00	20.00	58.64	44.98	20.00	44.98
J-101	true	true	1,000.00	1,500.00	1,001.80	1,501.80	20.00	49.57	45.00	20.00	45.00
J-102	true	true	1,000.00	1,500.00	1,008.00	1,508.00	20.00	54.36	45.00	20.00	45.00
J-103	true	true	1,000.00	1,500.00	1,006.20	1,506.20	20.00	55.76	45.00	20.00	45.00
J-104	true	true	1,000.00	1,500.00	1,003.20	1,503.20	20.00	63.02	45.01	20.00	45.01
J-105	true	true	1,000.00	1,500.00	1,004.60	1,504.60	20.00	60.38	45.01	20.00	45.01
J-106	true	true	1,000.00	1,500.00	1,002.80	1,502.80	20.00	51.02	45.01	20.00	45.01
J-107	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	60.36	45.02	20.00	45.02
J-108	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	68.77	46.11	20.00	46.11

Fire Flow Analysis
Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Residual Pressure (psi)	Calculated Residual Pressure (psi)	Calculated Minimum Zone Pressure (psi)	Minimum System Pressure (psi)	Calculated Minimum System Pressure (psi)
J-110	true	true	1,000.00	1,500.00	1,004.60	1,504.60	20.00	63.99	45.63	20.00	45.63
J-111	true	true	1,000.00	1,500.00	1,003.20	1,503.20	20.00	63.71	45.61	20.00	45.61
J-112	true	true	1,000.00	1,500.00	1,001.80	1,501.80	20.00	60.47	45.54	20.00	45.54
J-113	true	true	1,000.00	1,500.00	1,002.20	1,502.20	20.00	57.79	45.55	20.00	45.55
J-114	true	true	1,000.00	1,500.00	1,002.20	1,502.20	20.00	55.91	45.55	20.00	45.55
J-115	true	true	1,000.00	1,500.00	1,004.00	1,504.00	20.00	57.27	45.55	20.00	45.55
J-116	true	true	1,000.00	1,500.00	1,003.60	1,503.60	20.00	63.75	45.61	20.00	45.61
J-117	true	true	1,000.00	1,500.00	1,003.60	1,503.60	20.00	55.26	45.51	20.00	45.51
J-118	true	true	1,000.00	1,500.00	1,002.50	1,502.50	20.00	50.14	45.49	20.00	45.49
J-119	true	true	1,000.00	1,500.00	1,004.00	1,504.00	20.00	60.46	45.49	20.00	45.49
J-120	true	true	1,000.00	1,500.00	1,005.10	1,505.10	20.00	50.26	45.48	20.00	45.48
J-121	true	true	1,000.00	1,500.00	1,004.70	1,504.70	20.00	58.79	45.47	20.00	45.47
J-122	true	true	1,000.00	1,500.00	1,004.00	1,504.00	20.00	50.73	45.45	20.00	45.45
J-124	true	true	1,000.00	1,500.00	1,005.10	1,505.10	20.00	58.50	45.45	20.00	45.45
J-127	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	52.32	45.32	20.00	45.32
J-132	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	50.76	45.32	20.00	45.32
J-133	true	true	1,000.00	1,500.00	1,006.10	1,506.10	20.00	61.90	45.19	20.00	45.19
J-126	true	true	1,000.00	1,500.00	1,002.50	1,502.50	20.00	49.56	45.44	20.00	45.44
J-128	true	true	1,000.00	1,500.00	1,001.80	1,501.80	20.00	55.64	45.42	20.00	45.42
J-129	true	true	1,000.00	1,500.00	1,003.30	1,503.30	20.00	57.84	45.43	20.00	45.43
J-130	true	true	1,000.00	1,500.00	1,000.00	1,500.00	20.00	54.79	45.39	20.00	45.39
J-131	true	true	1,500.00	2,000.00	1,531.30	2,031.30	20.00	49.31	44.40	20.00	44.40

Preliminary Wastewater Report

For

WALKER BUTTE PHASE I

Prepared For:
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Phoenix, AZ 85048

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May 25, 2006

OLSSON ASSOCIATES

OA #2005-1479

Preliminary Wastewater Report
for
Walker Butte Phase I

Table of Contents

1.0 Introduction

Walker Butte Phase I is part of the larger 1720-acre master planned community located in the Town of Florence, Pinal County, Arizona. Phase 1 encompasses Sections 14 and 23 of Township 4 South, Range 8 East of the Gila and Salt River Meridian. The total area of Phase 1 is approximately 348-acres with 1305 single family homes and a 15-acre school site. The project abuts the Hiller Road alignment on the north, State Land on the west and east, and south of the Franklin Road alignment. Figure 1 presents the project location.

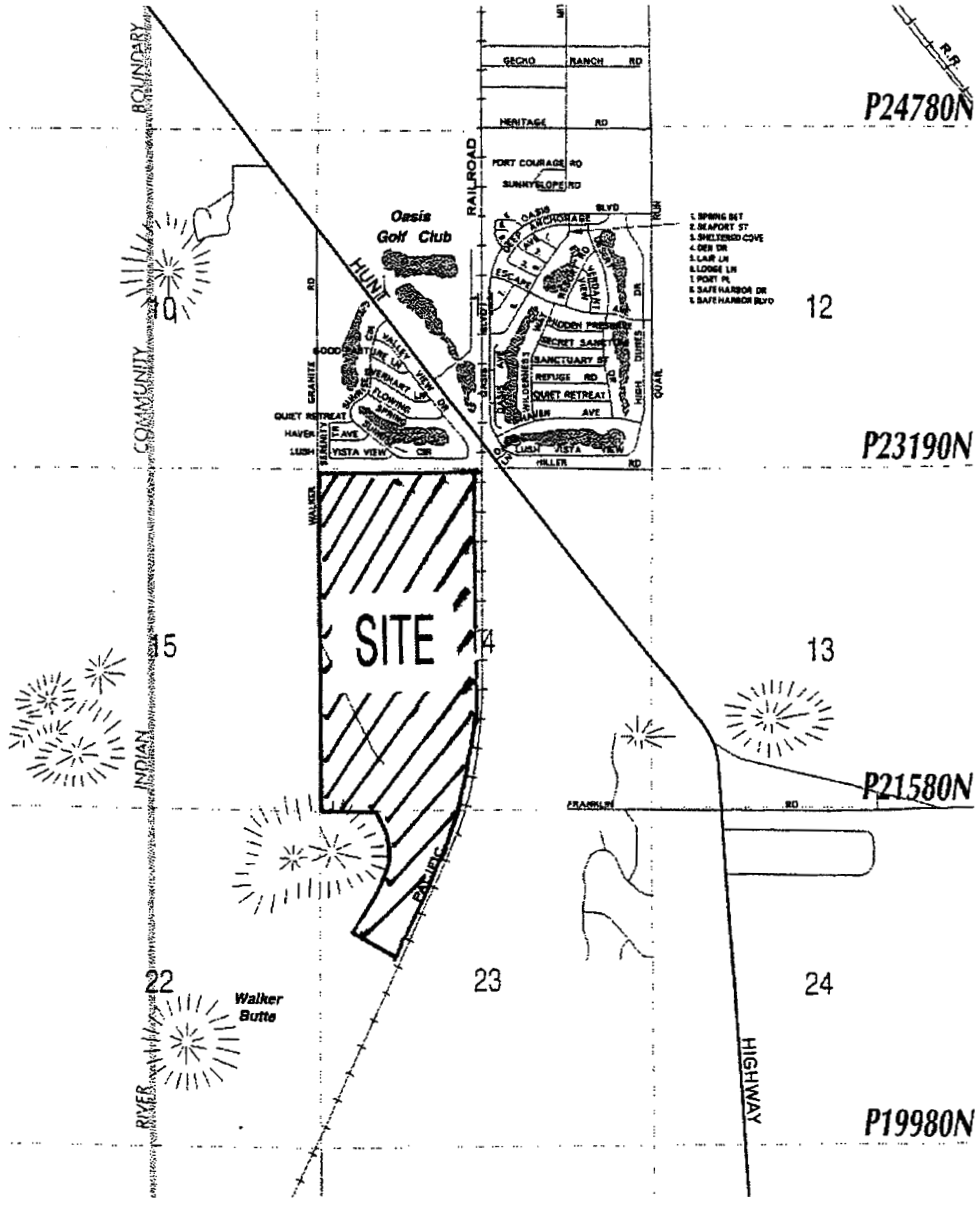


Figure 1. Project Location Map

The majority of Walker Butte is located within the CC&N area of Johnson Utility Companies (JUC). JUC has agreed to expand its CC&N to include the entire Walker Butte Project including additional wastewater infrastructure and sewage treatment capacity at an existing wastewater treatment plant. This preliminary wastewater report is prepared for compliance with JUC, Town, County, and State agencies design requirements for wastewater. The Walker Butte Phase I Planned Unit Development consists of a plan for single family development with additional sewer contribution upstream from future Walker Butte development including single family, multi-family, commercial, and public facilities. Phase I consists of only single family residential development and a 15-acre school site.

This report reviews current sewer infrastructure and determines if Walker Butte's contributing wastewater flow will not jeopardize current system capacity. According to previous discussions with JUC, wastewater treatment and sewer line sizes will be accommodated in infrastructure development prior to the completion of Walker Butte. The report provides wastewater system design criteria following JUC, Town of Florence, Arizona and Federal requirements (Arizona Administrative Code by the Arizona Department of Environmental Quality Bulletin 11 and Title 18, Chapter 9 of the Aquifier Protection Permit). The report presents a preliminary wastewater plan and analysis of the proposed sewer lines in Walker Butte Phase I to ensure that the entire system is capable of conveying required design peak flows.

2.0 Wastewater Design Criteria

The design of the sewer system follows Johnson Utility Company, Town of Florence City Code, Town Engineer criteria, ADEQ's Bulletin 11, and the Arizona Administrative Code. A summary of design criteria is presented in this section for proposed development of Walker Butte Unit 1.

2.1 Design Population

Based on information provided from the Walker Butte Unit 1 Preliminary Plat, 1305 single family homes and a school are proposed. Offsite sewer contribution upstream of Phase I is also considered in the report from future Walker Butte development. The source for the future Walker Butte lot density and commercial area comes from the County approved Planned Unit Development Narrative for Walker Butte dated January 28, 2005. Tables 1 and 3 below show wastewater demand design parameters for residential and commercial/schools. For purposes of this report, mixed use may either be commercial or residential. The more conservative value of residential (15 DU/Acre) was used.

Table 1. Residential Sewer Design Parameters

Residential Classif.	Lot Density (DU/AC)	Population (People/DU)	ADWF (GPCD)
Single Family	1.0,3.5,4.0,4.5	2.6	90
Multi-Family	8	2.6	90
Cluster	22	2.6	90

The residential peaking factor is based on the upstream population that the sewer line is serving according to the Arizona Administrative Code R18-9-E301D as shown below in Table 2.

Table 2. Residential Peaking Factors

Upstream Population	**Peaking Factor**
100	3.62
200	3.14
300	2.90
400	2.74
500	2.64
600	2.56
700	2.50
800	2.46
900	2.42
1000	2.38
1001 to 10,000	$PF=(6.330 \times P^{-0.231}) + 1.094$
10,001 to 100,000	$PF=(6.177 \times P^{-0.233}) + 1.128$

Table 3. Commercial/School Sewer Design Parameters

Commercial/School Contribution (GPAD)	Peaking Factor
1000	3.0

2.2 Gravity Sewer Design

The following criteria are provided in list form for design of gravity sewer system for Walker Butte:

1. Sewer lines shall be PVC SDR-35 material.
2. Typically, the minimum sewer line size is 8-inch diameter with one exception. The size line may be 6-inch for a dead end sewer line not exceeding 400-feet with no potential for extension and sewer line capacity not exceeded.
3. Manholes shall be installed at the end of each line, at all changes in grade, size, or alignment, and at all intersections that have incoming sewer lines.
4. Maximum manhole spacing is 500-feet for sewer line 18-inches or less in diameter.

5. Manholes with sewer line deflection of 45 degrees or more are required to have a 0.2-feet drop, a deflection between 5.1 and 45 degrees will require a 0.1-feet drop and less than 5 degree deflection will not require any drop.
6. Drop manholes are acceptable and shall be specified per MAG standards.
7. The minimum sewer line cover for 6-inch or greater diameter pipe is 4-feet.
8. The minimum horizontal distance from outside to outside of pipe walls, of six-feet shall be maintained between parallel water, sewer and storm drain lines.
9. The minimum pipe slopes shall be based on the minimum velocity of 2.0 fps when flowing full and not to exceed 10 fps. The following velocities are based on a Manning's "n" of 0.013

Pipe Size	Minimum Slope
8 inch	0.0033 ft/ft
10 inch	0.0024 ft/ft
12 inch	0.0019 ft/ft
15 inch	0.0014 ft/ft
18 inch	0.0011 ft/ft
21 inch	0.0009 ft/ft
24 inch	0.00077 ft/ft

10. Service taps may be connected to the manholes on the sewer line but may not be connected to an interceptor or larger sewer (in arterial road)
11. When sewer invert is less than 12-feet deep, a 4-foot diameter shaft with 24-inch cover shall be used. When exceeding an invert of 12-feet deep, a 5-foot diameter shaft with 30-inch cover shall be used.
12. Sewer lines shall be placed in public right-of-way or dedicated easements (minimum 12-feet width).
13. Standard location for sewer line within right of way is 6-feet north or east of the street centerline.
14. Sewer line may cross and re-cross the road centerline a short distance as long as a 10-feet separation is maintained with the waterline.
15. Curved sewer lines are not allowed.
16. Manholes cannot be located in areas subject to more than incidental runoff from rain falling in the immediate vicinity unless the manhole cover assembly is designed to restrict or eliminate storm water inflow.

2.3 Sewer Lift Station Design

The following criteria are provided in list form for design of sewer lift stations for Walker Butte:

1. Protect lift stations from physical damage from a 100-year flood event. Construction of a lift station is prohibited in a floodway.
2. Equip a lift station wet well with at least two pumps

3. Do not use section pumps if the sewage lift is more than 15-feet. Pumps shall be self-priming with a pump water brake horsepower at least 0.00025 times the product of the required discharge (in gallons per minute) and the required total dynamic head (in feet)
4. For lift stations receiving an average flow of more than 10,000 gallons per day, include a standby power source in the lift station that may be put into service immediately and remain available for 24-hours.

3.0 Onsite Sewer System

Upon evaluating the sewer demand based on the Walker Butte Phase I Preliminary Plat, the total dwelling units is 1,305 with a total population of 3393 people. Offsite sewer contribution from Manholes 22 and 32 add to the infrastructure size. 2116 residential homes and 3 acres of commercial produce 140 gpm of sewer flow at Manhole 32 and 637 gpm sewer flow at Manhole 22. At Manhole 32, sewer enters the Phase I system as gravity flow, whereas, at Manhole 21, the sewer enters from a force main.

Exhibit 1 shows a sewer plan of the proposed sewer lines in Walker Butte Phase I. Calculations for wastewater demand is provided in the Appendix which is based on number of residential lots or acreage of commercial parcels served by each pipe. A sewer design spreadsheet is developed to calculate the wastewater flow generated from the residential homes. Based on criteria as provided in this report, the sewer system will be mostly served by 8" lines with a minimum slope of 0.0033 feet/feet. As cumulative flow increases, the pipe size will increase to maintain capacity. In general, the trunk sewer system invert elevations were set 12-feet below existing ground. A sewer pipe sizing worksheet is provided in the Appendix which shows design capacity for all sewer lines larger than 8-inch diameter. The Phase 1 units are small enough as not to require any size larger than 8-inch at a minimum slope of 0.0033 ft/ft unless additional offsite flow is contributed.

A trunk line will be installed along the landscape tract between the residential lots and the railway. This trunk line will cross some retention areas. However, the manholes will be elevated about the 100-year water surface elevation and some will be water-tight if necessary.

All the flows will be delivered to a lift station at the Northeast corner, which is identified on the Master Sewer Map. This lift station will pump the sewage to the Section 11 WWTP via an 8" force main. Calculations as provided in the appendix showing lift station size, pump size, flow in, flow out, fill cycle and empty times. A summary below shows the lift station characteristics proposed:

Table 4 Lift Station Summary

Storage Height ft	Dia. ft	Volume ft^3	Qpump gpm	Qin gpm	Fill Time min	Cycle Time min	Empty Time min
8	8	402	1200	1103	1.80	19.98	21.77

As identified on Exhibit 1, sewer will be discharged to the Wastewater Treatment Plant (WWTP) in Section 11 of the same Township and Range north of Hunt Highway. An 8-inch forcemain is proposed to deliver wastewater to the existing forcemain in Hunt Highway from the Phase 1 Lift Station.

4.0 Offsite Sewer System

Based on demand calculations, 1,103 gallons per minute sewage flow will leave Walker Butte (per Exhibit 1). The proposed 8" sewer force-main is approximately 1 mile in length that will connect the lift station to the existing forcemain in Hunt Highway. JUC will upsize the force main in Hunt Highway to deliver the flow to the WWTP in Section 11 if necessary. No additional offsite flows were considered in this analysis.

5.0 Conclusions and Recommendations

This report presents the required information to support sewer infrastructure development for Walker Butte Unit 1 in compliance with JUC, City, County, and State regulations. In summary, 1,305 residential homes and school with additional offsite flows will contribute wastewater flow to JUC existing infrastructure. OA anticipates that there will be one sewer exit point from Walker Butte Unit 1 where 1,103 gallons per minute flow will be directed to Section 11's WWTP. According to conversations with JUC, wastewater flow from Walker Butte is anticipated and the wastewater treatment plant is sized to accept Walker Butte's demand. Existing sewer lines will either be able to handle the anticipated flows or be upsized to handle Walker Butte wastewater flows. The onsite system has been designed to carry the anticipated capacity. One lift station is expected onsite with sewer force-mains carrying wastewater to the existing infrastructure in Hunt Highway.

Appendix A

Design Documentation

Project: Walker Butte Phase 1 **Project No:** 05-1479

Walker Butte Phase 1 Sewer Pipe Minimum Slope Calculations

- Assume 2 ft/sec minimum velocity
- Assume PVC pipe, with Manning's n = 0.013

Manning's Equation:

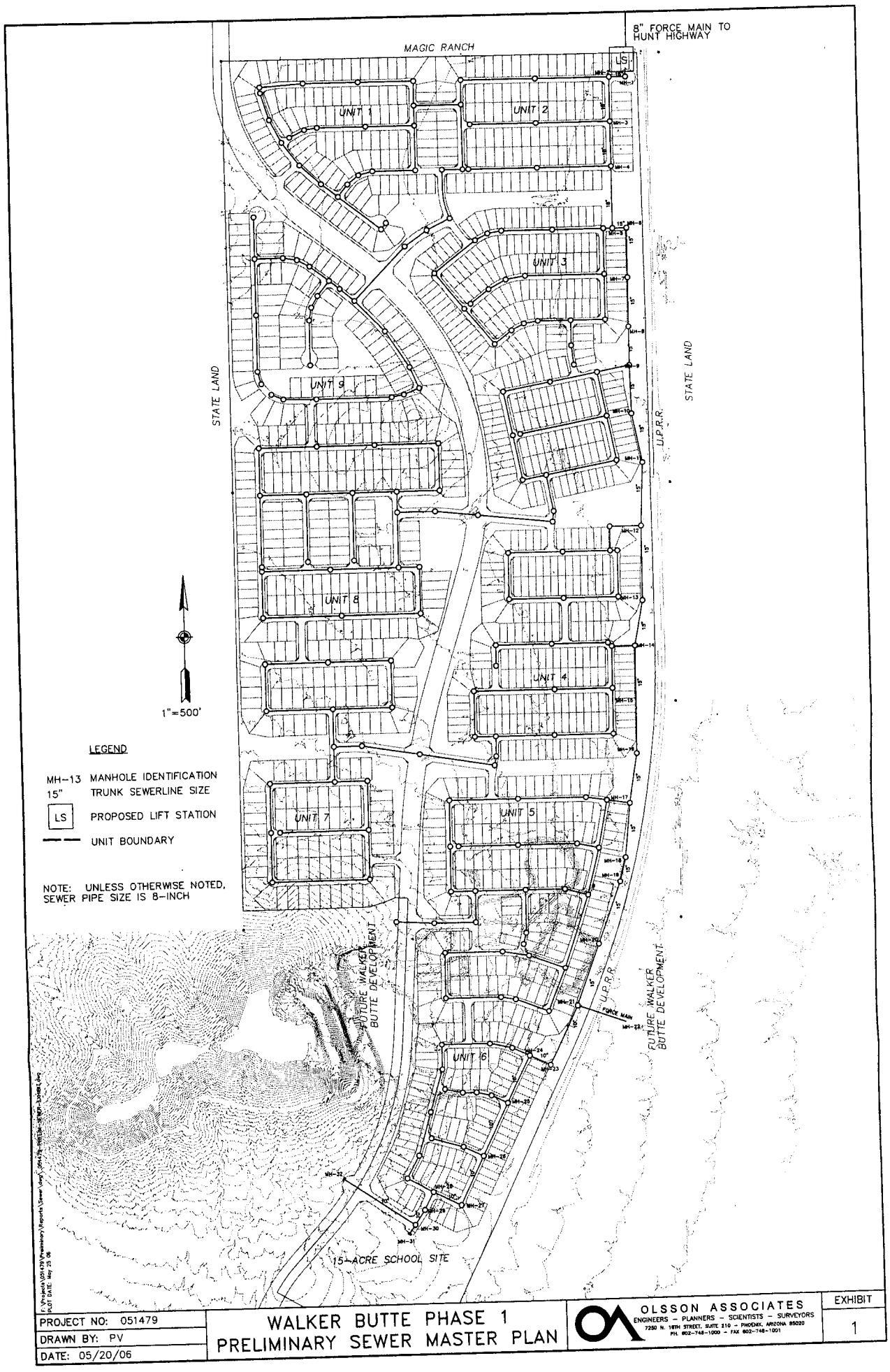
$$V = \frac{k}{n} \times R^{\frac{2}{3}} \times S^{\frac{1}{2}}$$

where:
V = 2 ft/s
k = 1.486
n = 0.013
R = hydraulic radius = area/wetted perimeter = D/4 (circular pipe)
D = pipe diameter
S = minimum slope

Solve for S:

$$S = \left[\frac{V}{\frac{1.486}{n} \times \left(\frac{D}{4} \right)^{\frac{2}{3}}} \right]^2$$

Pipe Diameter (in)	Minimum Slope (ft/ft)
6	0.00490
8	0.00334
10	0.00248
12	0.00194
15	0.00144
18	0.00113
21	0.00092
24	0.00077



F:\Projects\051479\Presentation\Reports\Sewer\dwg\051479-PRELIM-SEWER-EXHIBIT.dwg
PLOT DATE: May 23, 06

PROJECT NO: 051479	WALKER BUTTE PHASE 1 PRELIMINARY SEWER MASTER PLAN	OLSSON ASSOCIATES ENGINEERS – PLANNERS – SCIENTISTS – SURVEYORS 7250 N. 16TH STREET, SUITE 210 – PHOENIX, ARIZONA 85020 PH. 602-748-1000 – FAX 602-748-1001	EXHIBIT
DRAWN BY: PV			1
DATE: 05/20/06			

Walker Butte Phase 1 Sewer Pipe Capacity Calculations

- Assume 2 ft/sec minimum velocity
- Assume PVC pipe, with Manning's n = 0.013
- For single family, assume 2.6 persons/unit, 90 gallon/person per day
  Peak usage per SFR = 2.6 * 90 * PF (varies)
  Peaking Factor=6.33*(population)^(-0.231))+1.094
- For commercial, assume 3000 gallon/acre per day
  Peak usage per commercial acre = 3000 * 3 = 9000 gpd = 6.250 gpm

Manning's Equation:

$$Q = V \times A = \frac{k}{n} \times R^{\frac{2}{3}} \times S^{\frac{1}{2}} \times A = \frac{k}{n} \times \left(\frac{D}{4}\right)^{\frac{2}{3}} \times S^{\frac{1}{2}} \times A$$

where:
V = 2 ft/s
k = 1.486
n = 0.013
R = hydraulic radius = area/wetted perimeter = D/4 (circular pipe)
D = pipe diameter
S = minimum slope

[D] Pipe Diameter (in)	[S] Min Slope (ft/ft)	[V] Min Velocity (ft/s)	[A] Area (ft^2)	[Q] Capacity (cfs)	[Q] Capacity (gpm)	[PF] Peaking Factor	[HU] Housing Units Served	Commercial Acres Served (ac)
6	0.00490	2.0	0.1963	0.393	176	2.32	467	28
8	0.00334	2.0	0.3491	0.698	313	2.15	896	50
10	0.00248	2.0	0.5454	1.091	490	2.03	1484	78
12	0.00194	2.0	0.7854	1.571	705	1.95	2224	112
15	0.00144	2.0	1.2272	2.454	1,102	1.86	3644	176
18	0.00113	2.0	1.7671	3.534	1,586	1.79	5453	253
21	0.00092	2.0	2.4053	4.811	2,159	1.74	7636	345
24	0.00077	2.0	3.1416	6.283	2,820	1.70	10208	451

Project: Walker Butte Phase 1

Capacity of Walker Butte Phase 1 Stubs

- Assume 2 ft/sec minimum velocity
- Assume PVC pipe, with Manning's n = 0.013

Design Parameters:

Single Family Residence (SFR):	2.6 persons/D.U. @	90 gallons/day per person
Multi-Family (MF):	2.6 persons/D.U. @	90 gallons/day per person
Commercial:	3000 gallons/acre per day	

Onsite Parcel Contribution

Units Served	Single Family (du)	Exceeds Minimum for 8" PIPE?[1]
1	113	NO
2	113	NO
3	229	NO
4	187	NO
5	170	NO
6	101	NO
7	122	NO
8	175	NO
9	95	NO

Note 1: Based on Capacity Calculation for 8" pipe at 0.0033 ft/ft slope, a maximum of 896 units may be served

Offsite Contribution

Node	Units Served	Single Family[1] (du)	Multi Family[1] (du)	Cluster[1] (du)	Mixed Use[2] (du)	School & Pub. Fac.[1] (acres)	Total Residential (du)	Total Commercial** (acres)
MH-1 (South)	M, DD	168	0	0	0	15	168	15.00
MH-2 (East)	C,E,L,W,X,BB, CC,NN	696	0	644	608	3	1948	3.00

Node	Residential DU (units)	Commercial Equivalent[3]	Total Population	Population Density (person/DU)	Residential Population (person)	Avg. Daily Usage (gpd/person)	Peak Factor[4]	$Q_{Residential}$ (gpd)	$Q_{Residential}$ (gpm)
MH-1 (South)	168	192	360	2.6	937	90	2.40	202098	140
MH-2 (North)	1948	38	1986	2.6	5165	90	1.97	916831	637

Notes:
1. Dwelling Units based on Planned Unit Development Narrative dated January 28, 2005 by UEG and Lazarus
2. Mixed Use considered residential since more conservative
3. Commercial Equivalent = Acres x 3000 / (2.6 x 90)
4. Peaking Factor=6.33*(population)^(-0.231))+1.094

Project: Walker Butte Phase 1

Project No: 05-1479

Walker Butte Phase 1 Sewer Pipe Sizing

- Assume 2 ft/sec minimum velocity
- Assume PVC pipe, with Manning's n = 0.013

Design Parameters:

Single Family Residence (SFR): 2.6 persons/D.U. @ 90 gallons/day per person
Commercial/School: 3000 gallons/acre per day

Manhole ID	Units Served	No. of Lots	Area Population	Cumulative Upstream Population	Average Daily Flow (gpd)	Peak Factor	Peak Daily Flow (gpd)	Peak Daily Flow (gpm)	Cumulative Peak Flow (gpm)	Pipe Diameter (in)	Min Slope (ft/ft)	Min Velocity (ft/s)	Capacity (gpm)	% of Capacity
to Lift Station														
1			0	9499	854,910	1.86	1,587,621	1,102.5	1,102.5	18	0.00120	2.0	1,586	69.5%
2	1, 2, 9	259	674	8825	794,250	1.87	1,485,364	1,031.5	1,031.5	18	0.00120	2.0	1,586	65.0%
3	2	30	78	8747	787,230	1.87	1,473,490	1,023.3	1,023.3	18	0.00120	2.0	1,586	64.5%
4	2	32	84	8663	779,670	1.87	1,460,692	1,014.4	1,014.4	18	0.00120	2.0	1,586	64.0%
5	2	137	357	8306	747,540	1.88	1,406,190	976.5	976.5	18	0.00150	2.0	1,586	61.6%
6			0	8306	747,540	1.88	1,406,190	976.5	976.5	15	0.00150	2.0	1,102	88.6%
7			0	8306	747,540	1.88	1,406,190	976.5	976.5	15	0.00150	2.0	1,102	88.6%
8			0	8306	747,540	1.88	1,406,190	976.5	976.5	15	0.00150	2.0	1,102	88.6%
9	3, 8	267	695	7611	684,990	1.90	1,299,521	902.4	902.4	15	0.00150	2.0	1,102	81.9%
10			0	7611	684,990	1.90	1,299,521	902.4	902.4	15	0.00150	2.0	1,102	81.9%
11			0	7611	684,990	1.90	1,299,521	902.4	902.4	15	0.00150	2.0	1,102	81.9%
12	4	68	177	7434	669,060	1.90	1,272,228	883.5	883.5	15	0.00150	2.0	1,102	80.2%
13			0	7434	669,060	1.90	1,272,228	883.5	883.5	15	0.00150	2.0	1,102	80.2%
14	4, 7	241	627	6807	612,630	1.92	1,175,098	816.0	816.0	15	0.00150	2.0	1,102	74.1%
15			0	6807	612,630	1.92	1,175,098	816.0	816.0	15	0.00150	2.0	1,102	74.1%
16			0	6807	612,630	1.92	1,175,098	816.0	816.0	15	0.00150	2.0	1,102	74.1%
17	5	170	442	6365	572,850	1.93	1,106,174	768.2	768.2	15	0.00150	2.0	1,102	69.7%
18			0	6365	572,850	1.93	1,106,174	768.2	768.2	15	0.00150	2.0	1,102	69.7%
19			0	6365	572,850	1.93	1,106,174	768.2	768.2	15	0.00150	2.0	1,102	69.7%
20			0	6365	572,850	1.93	1,106,174	768.2	768.2	15	0.00150	2.0	1,102	69.7%
21			0	6365	572,850	1.93	1,106,174	768.2	768.2	15	0.00150	2.0	1,102	69.7%
22	C,E,L,W,X,BB,CC,NN	1986	5164	5164	464,760	1.97	916,703	636.6	636.6	12	0.00200	2.0	705.0	90.3%
23			0	1201	108,090	2.32	251,239	174.5	174.5	10	0.00250	2.0	490.0	35.6%
24	6	36	94	1107	99,630	2.35	233,905	162.4	162.4	10	0.00250	2.0	490.0	33.1%
25	6	21	55	1052	94,680	2.36	223,689	155.3	155.3	10	0.00250	2.0	490.0	31.7%
26	6	24	63	989	89,010	2.38	211,916	147.2	147.2	10	0.00250	2.0	490.0	30.0%
27			0	989	89,010	2.38	211,916	147.2	147.2	10	0.00250	2.0	490.0	30.0%
28	6	20	52	937	84,330	2.40	202,136	140.4	140.4	10	0.00250	2.0	490.0	28.6%
29			0	937	84,330	2.40	202,136	140.4	140.4	10	0.00250	2.0	490.0	28.6%
30			0	937	84,330	2.40	202,136	140.4	140.4	10	0.00250	2.0	490.0	28.6%
31	school	192	500	500	45,000	2.60	117,018	81.3	81.3	10	0.00250	2.0	490.0	16.6%
32	M, DD	168	437	437	83,030	2.65	219,864	152.7	152.7	10	0.00250	2.0	490.0	31.2%

Notes:
1. Offsite contribution calculations for MH 22, 31 and 32 are calculated in Capacity of Walker Butte Phase 1 Stubs

WALKER BUTTE PHASE 1 WET WELL DESIGN

VOLUME GIVEN CYCLE TIME AND FLOWS
$t=V/(Q_{pump}-Q_{in})+V/Q_{in}$

t (min)	Qin (gpm)	Qpump (gpm)	Volume (gal)	Volume (ft^3)
30	1103	1200	2687.0	359.2

MINIMUM VOLUME GIVEN CYCLE TIME IN MINUTES
$t=4V/Q_{out}$

t (min)	Q_{pump} (gpm)	Volume (gal)	Volume (ft^3)
6.5	1200	1950	260.7

CYCLE TIME GIVEN VOLUME AND FLOW
$t=V/(Q_{pump}-Q_{in})+V/Q_{in}$

Volume (gal)	Q_{in} (gpm)	Q_{pump} (gpm)	Fill Time (min)	Cycle Time (min)	Empty Time (min)
1950	1103	1200	1.80	19.98	21.77

Wet Well Height Calculation
H=Volume/Area

Diameter	8 ft
Area	50 ft^2
Height, H	8 ft